Early Grade Reading and Mathematics Assessment in the Republic of Macedonia: Baseline Study Report

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LIST OF ABBREVIATIONS

BDE	Bureau for Development of Education
clpm	correct letters per minute
cwpm	correct words per minute
EGMA	Early Grade Mathematics Assessment
EGRA	Early Grade Reading Assessment
MDG	Millennium Development Goal
MOES	Ministry of Education and Science
NEC	National Examinations Center
OECD	Organization for Economic Co-operation and Development
RTI	RTI International (trade name of Research Triangle Institute)
PIRLS	Progress in International Reading and Literacy Study
PISA	Programme for International Student Assessment Tests
SSME	Snapshot of School Management Effectiveness
TIMSS	Trends in International Mathematics and Science Study
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Assessments of student learning in the primary grades, with instruments such as the Early Grade Reading Assessment (EGRA) and Early Grade Mathematics Assessment (EGMA), offer an opportunity to determine whether early grade students are developing the fundamental skills upon which all other literacy and mathematical skills build, and, if not, where efforts might be best directed. This is vital information for countries that are working to improve the quality of education in their schools, such as the Republic of Macedonia.

However, of equal importance to understanding how well children have mastered foundational skills is an understanding of school and classroom practices as well as parental involvement traditionally associated with student performance.

To gain insight into student foundational reading and mathematics skills, USAID Readers are Leaders Project, implemented by the Foundation for Education and Cultural Initiatives "Step by Step" - Macedonia in partnership with the Bureau for Development of Education (BDE) and the National Examinations Center (NEC) conducted the EGRA and EGMA, in a sample of 42 primary schools in Macedonia. Furthermore, to better understand characteristics among schools associated with student performance in reading and math, questionnaires were administered to school directors, teachers and parents.

The main objective of the baseline study was to explore the existing situation in the schools, and based on the identified needs and findings to plan appropriately the future project activities in the schools, tailoring the training modules to the needs of teachers for professional development and involvement of families and local communities in promoting the reading and mathematics skills in early grade students. The findings will also ensure ongoing monitoring and evaluation of changes in the schools after the introduction of the project interventions.

The initial section of this report refers to the oral assessments of 2,021 students with the help of EGRA and EGMA instruments in the schools and explains the design of the various subtests of the instruments, pointing out how they are related to important characteristics of early reading and mathematics. The test adaptation process, pretesting, and pilot testing stages are then described, followed by a description of the sampling and testing procedures. Afterward, the analysis of results is presented in detail followed by general observations.

The second part presents the findings from the background questions answered by assessed students, online and hard copy questionnaires filled out by school directors, teachers and parents as well as inventories of school and classroom resources prepared during the school visits.

The report concludes with conclusions and recommendations.

Main Findings and Recommendations

The baseline findings revealed areas of strength as well as areas needing improvement in schools in Macedonia. The main findings and recommendations from this study are summarized in the table below.

Findings	Recommendations
Student performance on EGRA	
Students perform well in naming letters correctly, but this skill is not translated into good levels of reading fluency, as automaticity in reading familiar words and short stories is not acquired at the needed level to become competent readers.	More time of the instruction should be focused on shared and independent reading as appropriate, ensuring that students have time to practice their new skills to increase the reading fluency and accuracy.
Grade 2 and Grade 3 students from Macedonia are lagging behind by not reading fast enough to be able to understand the text and accurately respond to comprehension questions.	Children should be exposed to different types of inferential questions (expressing own opinion, interpretation of facts or judgment) from an early age.

EGRA results should be used for opening policy dialogue with education institutions for establish national reading performance measures.

Reading progress should be monitored a few times per year to determine if they are meeting the benchmark standards that serve as predictors of reading success. |
Student performance on EGMA	
Students have reasonably good results on subtasks requiring procedural (recall) knowledge (number identification and simple addition and subtraction), but there is a drop-off in performance when conceptual (applied) knowledge is required (missing numbers, more complex addition, subtraction, word problems).	Instruction on early numeracy skills should assure that teachers focus attention to understanding, reasoning and application, offering opportunity for students to practice calculations in developing learning and understanding, and experience mathematics as a meaningful, sense-making, problem-solving activity rather than memorization of facts, rules, formulas and procedures.
Availability of learning materials and equipment in early grade classrooms	
Teachers and students do not suffer from a shortage of textbooks as they are provided by the Ministry of Education and Science, but there is a lack of children's access to additional reading materials, both at school and at home. The is most evident for Albanian language materials and for rural schools.	Access to reading materials (in addition to textbooks) needs to be increased at schools. An initiative for school library campaign (including summer reading challenge) may be needed.
Most of the classroom walls are suitably decorated with student projects and teaching materials. Desks and chairs are not always arranged in a way to stimulate group work and classrooms are not	Support should be provided especially to rural schools in terms of making their classroom more student friendly and creating an effective learning environment for the students.

Findings	Recommendations
divided into different activity centers.	
Most of the teachers use the classmate computers and various digital books, activities and games with the children on a weekly basis.	The digital resources used in the classroom should be updated and enriched with new content suitable for early grade reading, writing and mathematics, both for individual and group work.
Teachers' Training Needs Assessment	
Vast majority of teachers report a lack of targeted pre-service or in-service training in how to teach reading and mathematics.	Training for both pre-service and in-service teachers needs to focus on developing the subject content knowledge (development of early grade-specific skills in teaching reading and mathematics) and the pedagogical content knowledge (developing a more child-centered pedagogy).
Additional training is needed on developing a more child-centered pedagogy and effective learning environment.	The early grade education community needs exposure to current international best practices for early grade teaching approaches both for reading and for mathematics (adopt more learner-centered approaches, involve more demonstration and practice situations and involve coaching/mentoring approaches).
School practices	
Few teachers, but more than 20% of students are often absent from school (3-10 days per year).	Reasons should be explored why 1 in 5 students are absent from school as regular attendance is closely related with student performance.
Information is needed on how students spend time on task.	Subsequent studies and class observations should explore how classroom time is used.
Pedagogic Oversight	
Teachers regularly plan for their lessons and collaborate with other teachers about planning or discussing curriculum issues.	It is recommended to obtain further information on how the time is divided among different classroom activities to help teachers to use time well in class and the feedback may be used for fine-tuning. School management (director, assistant director) should be accountable for monitoring teachers' presence, tardiness and classroom instructional time.
School directors, student support staff and BDE advisors monitor teacher's performance with different frequency during the school year.	As observation may take a lot of time and provide numerous data, school management should be trained on how to recognize the major components of instructional time use with brief

Findings	Recommendations
	observations and how to use this system in their work.
Parental Involvement at Schools and at Home	
Parents need to be more involved in the schooling of their children.	Access to reading materials (in addition to textbooks) needs to be increased in homes. A national campaign that makes parents aware of the role that they play in their children's education in general, and specifically encouraging them to provide more reading materials for their children, is needed.

Key lessons learned:

The application of EGRA and EGMA in Macedonia has demonstrated that these early grade assessments provide critically important information for the review of education sector program and policy. EGRA and EGMA should be incorporated into the set of instruments used as part of the regularly scheduled assessments on national level. The results of Grade 2 and Grade 3 reading (in Macedonian and Albanian) and mathematics performance would then be reported as part of the overall Macedonian education sector performance.

The data received with the questionnaires constitute the skeleton of the situation in schools in Macedonia regarding the available learning resources, existing school practices and parental involvement in schooling of their children. However, in order to provide more details and have deeper understanding it is also necessary to conduct focus group interviews with school directors, teachers, parents and students to tailor activities that will strengthen literacy and numeracy of early grade students.

Class observations are more than necessary to see what is really going on during the lessons, how instructional time is divided and time on task spent in an endeavor to improve reading and mathematics instruction and learning outcomes of students.

1. PROJECT BACKGROUND

USAID's Readers are Leaders Project is 30-month initiative, designed to improve early-grade students reading and numeracy skills, strengthen teachers' pedagogical skills, especially diagnostic and formative assessment skills, and increase overall community recognition of the value of reading and numeracy skills for students' intellectual growth.

The Foundation for Education and Cultural Initiatives "Step by Step" – Macedonia implements this project in close consultation with Macedonia's national education institutions - the Bureau for Development of Education (BDE) and the National Examinations Center (NEC) to ensure high quality results and sustainability of project activities. The project will be implemented from May 2013 – November 2015 in 62 selected schools, from different regions of the country, both rural and urban, with due consideration to ethnic, gender, social and geographical diversity.

Readers are Leaders Project is comprised of five components, each having multiple activities to encourage reading and numeracy skills in early grade children:

- Component 1: Reading and Numeracy Assessment
- Component 2: Professional Development
- Component 3: Learning Communities
- Component 4: Digital Learning Resources
- Component 5: Family and Community Involvement

By involving all stakeholders in the implementation of project activities - students, parents, community members, teachers, municipal education officers, BDE and NEC staff - and working with all of them together, instead of working individually with different groups of stakeholders, Step by Step Macedonia believes it is possible to make positive change in the society, from the community to the highest system level.

Prior to undertaking the planned interventions for improving the early grade literacy and numeracy, the project decided in addition to measuring student performance with EGRA and EGMA instruments conducted from May 19 to June 3, 2014 in 42 primary schools to explore the existing situation in the selected primary schools that will be in the focus of the project activities in the forthcoming period by administering questionnaires to school directors, teachers and parents.

The reasons why the baseline study is performed one year after the project start are the following:

- The project started in May 2013, and the earliest possible date to administer EGRA and EGMA was December 2013, after the two instruments had been finalized and the training for administration had been delivered. As the initially planned population of Grade 2 and 3 students would not have been sufficiently taught in the topics covered by the two tests by December, it was therefore decided to administer EGRA and EGMA to comparable groups in grade 3 (for the grade 2 tests) and grade 4 (for the grade 3 tests). This has raised validity issues, as these latter groups of children could not constitute the baseline population from which progress is to be measured in 2014 and 2015. So, in consultation with USAID AOR and M&E specialist as well as assessment consultant José Noijons, it was decided to treat the December 2013 administration as a pilot study to try out all procedures and to analyze the validity of the instruments and discrimination of test items.

- One of the performance indicators adopted for the project is: proportion of students who, by the end of three grades of primary schooling, demonstrate that they can read, understand the meaning of the text and do math suitable for their grade level, an indicator which directly contributes to USAID Goal One of improving reading skills for 100 million children in primary grades by 2015. This is why the baseline study had to be conducted at the end of school year.

- All project interventions for improving learning outcomes in early-grade reading and math are to be based on reliable research data obtained with the baseline study, so it was logical to conduct this initial assessment of the situation in the schools during the baseline study.

The main objectives of the baseline study were to gain insight into student foundational reading and mathematics skills and to better understand characteristics of schools associated with student performance in reading and math. This report presents the baseline information gathered from:

- EGRA and EGMA administration in 42 primary schools;
- Online questionnaires filled out by the school directors, teachers and parents from the sample of 42 schools;
- Hard copy questionnaires filled out by parents;
- Interviews with teachers to assess their training needs;
- Field visits conducted in 27 schools to assess the available learning materials and equipment in the early grade classrooms.

All the data presented in this report will be used for planning the activities in the forthcoming period, tailoring the training modules to the needs of teachers for professional development and involvement of families and local communities in promoting the reading and mathematics skills in early grade students.

2. EGRA AND EGMA BASELINE STUDY

2.1 Background

The lack of quality data on assessment of early grade literacy and numeracy skills in Macedonia, particularly after the introduction of the Framework for Nine Year Primary Education in 2007, makes it difficult to provide a clear overview of the current status of students' reading and math performance in the country. The existing data from the international studies conducted in Macedonia (Progress in International Reading and Literacy Study – PIRLS 2001 and 2006[1], Trends in International Mathematics and Science Study – TIMSS[2] 1999, 2003 and 2011) as well as the most recent national assessment studies

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[1] **PIRLS 2001 International Report:** IEA's Study of Reading Literacy Achievement in Primary Schools, Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., & Kennedy, A.M. (2003), Chestnut Hill, MA: Boston College.

PIRLS 2001 National Report on student achievements in Macedonia: Bureau for Development of Education, Bojana Naceva, Gorica Mickovska, Skopje (2003).

[2] **TIMSS-R 1999 National Report** on student achievements in Macedonia: Bureau for Development of Education, Anica Aleksova, Nikola Mitevski, Skopje (2000).

(Natural Sciences and Social Sciences Assessment for lower-grade students and Math and Literacy Assessment for upper-grade students in 2006) indicated poor achievements by primary grade-level students in Macedonia, which further deteriorate with every new cycle of assessment.

The Programme for International Student Assessment Tests (PISA) results in 2000, measured in forty-one countries throughout the world, ranked Macedonia in 38th position. The results indicated that 34.5% of the pupils who had completed or were about to complete primary education had not even achieved the first level of proficiency (out of five levels), while an additional 28.1% had only reached the first proficiency level. These results are a serious indicator of the (poor) quality of teaching and illustrate the need for systemic changes in order to raise the level of the population's actual literacy.

In order to improve the low level of literacy among the population that formally completed primary education, one of the recommendations in the second Report of the Republic of Macedonia on the Millennium Development Goals[3] is to introduce national standardized tests at the end of each cycle in primary education. Thus, pupils, teachers and schools will be able to monitor to what extent the teaching targets have been achieved. Moreover, it is important to use every opportunity for Macedonia to be included in the international standardized tests. This could offer valuable information on any weaknesses and identify priorities for improvement of the quality of teaching. Additionally, the test results could be used to compare the attainment levels of boys and girls, members of different ethnic communities and of children in rural and urban areas thus establishing a good basis for the development of strategies to overcome disparities related to vulnerable categories.

To this aim, the Step by Step Foundation team, as part of the USAID Readers are Leaders project works closely with the Bureau for Development of Education and the National Examinations Center to collect literacy and numeracy assessment data and analyze them for diagnostic purposes. The project utilizes two international assessment tools[4]:

- The Early Grade Reading Assessment (EGRA[5]) as a one-on-one oral assessment instrument, providing a simple diagnostic tool that measures individual student progress in reading.

- The Early Grade Mathematics Assessment (EGMA) measuring student foundational skills in numeracy and mathematics.

The EGRA and EGMA tools, standardized to the local context, measure how well students are learning basic reading and mathematics skills in second and third grade, identify the bottlenecks in acquiring these skills and subsequently will help develop intervention in reading and mathematics improvement.

TIMSS 2003 National Report on student achievements in Macedonia: Bureau for Development of Education, Anica Aleksova, Boris Miteski, Skopje (2006).

TIMSS 2011 National Report on student achievements in Macedonia: Bureau for Development of Education, Beti Lameva, Reshad Ramadani, Skopje (2013).

[3] Government of the Republic of Macedonia (2009) REPORT ON THE PROGRESS TOWARDS THE MILLENNIUM DEVELOPMENT GOALS: United Nations Development Program
http://www.undp.org/content/dam/undp/library/MDG/english/MDG%20Country%20Reports/Former%20Yugoslav%20Republic%20of%20Macedonia/MDG%20Report%2009%20ENG.pdf

[4] Since 2006, EdData II, implemented by RTI International, has developed several instruments including EGRA and EGMA to capture essential, reliable, and valid education data, which were piloted in multiple countries, with funding from both USAID and other donors (www.eddataglobal.org).

[5] USAID Readers are Leaders Project will use the EGRA findings to design comprehensive programs to improve children's reading skills. EGRA is the key element that will help us reach USAID's global target: to improve the reading skills of 100 million children all over the world.

2.2 Baseline Study

EGRA and EGMA instruments were piloted in December 2013 with 1,762 assessments of Grade 3 and Grade 4 students from 22 primary schools in both Macedonian and Albanian languages. The piloting of instruments allowed us to see how the instruments work, how the students respond to the tasks and how successful assessors were in collecting the data with the tablet computers.

The pilot study gave important and useful input the project has used for improving the quality of the baseline study. The main recommendations and lessons learned from the pilot study were appropriately addressed and applied in the baseline study. These include:

- *Instrument structure from pilot study was maintained* for the baseline, including the same subtasks as the piloted instruments to make sure that the instruments measure what they were developed to measure. However, two shorter texts per grade were developed for the Reading Fluency and Comprehension task with different types of questions in order to be able to assess more reliably the reading comprehension and be able to discriminate among students at different stage of cognitive development. The comprehension questions were carefully phrased, to avoid any closed questions that simply required "yes" or "no" for an answer.

- *Instructions in the tablets and the instruction manual were revised and aligned*. Typos were corrected. Stop rules were also checked and aligned. The instruction manuals were modified reflecting the changes in the instructions and subtasks.

- *Observation of the assessment process proved to be of critical importance -* all issues with the test items and forms observed during the pilot assessment were addressed and the instruments were modified by the members of the Work Groups to reflect the feedback from the field. Number of observers (particularly from the ranks of the National Examinations Center) has increased as well the visits to schools, making sure to have one observer per school at the first day of the baseline study. Moreover, different observers were assigned to monitor the process in one school in order to control the quality of the administration process and the collected data.

- *Better quality tablet computers procured to prevent data loss -* the newly procured tablet computers Google Nexus have better support services, more responsive processor, more advanced touchscreens and larger RAM memory, which directly affects the effectiveness of the tablet and thus the assessment process. Tablets were procured for each school from the Phase 2 schools as well as additional tablets to be used for practice during the next rounds of training. Some of these training tablets were borrowed to the schools that had to assess larger number of children in both Macedonian and Albanian language so that the assessors were able to test more students in shorter time.

- *Sufficient number of assessors were adequately trained –* following the recommendation of the pilot study, two assessors were trained from each phase 2 school to be able to administer EGRA and EGMA instruments in the selected schools, without too much disruption of the daily schedule of activities and classes of the assessors. Additional assessors were also trained from the pilot phase schools (especially the schools in which only one assessor was trained). Inter-rater reliability was again integral part of the training to make sure that different assessors assess the tested students in the same way.

- *Testing conditions were equalized in all schools* –special attention was paid to the following: providing quiet place with adequate light and temperature; clearly marked to prevent any disruptions and even locked if necessary; establishing good rapport with the students, to make the atmosphere less stressful and more relaxed; materials neatly organized and placed within the reach of the assessor; instructions read out in a clear, understandable manner, exactly as they are provided in the tablet, without skipping parts or any further modifications; stop rules to be observed accordingly; to provide counters, paper and pencil or encourage the student to use fingers for EGMA tasks, such as addition, subtraction and word problems; data from the tablets to be uploaded on the cloud at the end of each working day to minimize eventual data loss.

- *Questionnaires for school directors, teachers and parents administered during* the baseline - to receive additional background information about the students and to explore how these variables affect the student performance.

- *Assessment standards were observed during data collection process* - suggestions and recommendations made by the National Examinations Center, as the main institution tasked for all assessments and examinations in the schools across the country, were applied during EGRA and EGMA administration: the modified EGRA and EGMA instruments were made available to the assessors just prior to the administration process, so they were able to download the instruments at least two days before the testing starts in order to be able to familiarize themselves with the instructions and contents of the tasks; the list of students included in the sample, the worksheets for the students and other accompanying materials were sent to all schools two days prior to the assessment process, so that the assessors could be better prepared; school with larger number of students to be assessed received additional tablet computer for more efficient administration; students were not notified in advance about the assessment process; data were collected only during the classes – they were not asked to come earlier or stay after the classes; teachers were notified of the assessment process, but were not told in advance, which students would be assessed in order to avoid practicing of the tasks.

The lessons learned in the piloting process helped the project team to be better prepared for the baseline study.

The actual administration of EGRA and EGMA baseline instruments took place in the period from May 19 to 30, 2014. This period was found to be the most suitable for assessing the students at the end of Grade 2 and 3, as they have completed the planned lessons in reading and mathematics according to the curriculum. Furthermore, in consultation with the National Examinations Center it was decided that this is a good period of the school year for assessment of early grade students, because the external assessment for students from upper grades was scheduled for early June.

The assessment process had to be extended for several days in one school because a fire broke in the primary school "Drita" from Rashce village in Saraj municipality, severely damaging the school's sport hall, teachers' office and the pedagogue's office. Fortunately, the tablet computer provided to the pedagogue who was responsible for the assessment process was spared from the fire and the testing in this school was extended until June 3, 2014.

Following the already established procedure, first EGRA instrument was applied to all students in Grades 2 and 3 and after few days of break the EGMA tool was administered to the same cohort of students.

2.3 Sample design

The sampling design and procedure were prepared following the model applied in the pilot study by PhD Beti Lameva from the National Examinations Center.

There are around 350 primary schools in Macedonia, of which 190 applied to take part in the project activities through the open call announced in September 2013. Total of 61 schools from all eight regions in the country were selected, 21 to take part in the pilot phase, 20 more schools in the baseline measurement in 2014 and yet another 20 schools in 2015 measurement. The school for children with disabilities "Maca Ovcarova" from Veles was selected as 62nd school with an aim to get insight in how these children respond to different reading and mathematics tasks.

The target population was defined as all students enrolled in Grade 2 and 3, with Macedonian and Albanian language of instruction in the 21 pilot schools plus 20 phase 2 schools. Using enrollment data from the pedagogues, a sample of students was selected using a stratified random design with proportional allocation based on school location, language of instruction and school size to ensure all regions would have a probability of selection equal to their actual distribution in the country. Regarding the special school, the educators trained to administer EGRA and EGMA selected 10 students with different level of physical and/or intellectual disabilities.

The 41 schools were divided into two strata according to the language of instruction (Macedonian and Albanian). The bi-lingual schools were considered as two separate schools. In order for the sample of students to reflect as close as possible the features of selected schools, first the ratio between Macedonian and Albanian students was determined. Then based on the number of students in Grade 2 and Grade 3, schools were divided into small, medium and large schools to calculate the number of students to be selected in each group.

The selection of students within one schools was done through the following steps:
- Total number of Grade 2 students with same language of instruction is divided with the pre-defined number of students to be included in the sample (1,000) to get number A.
- Number A was then multiplied with a random number (any digit from 1-9 or combination of these digits) to get number B. Then number B was compared with the number of students in the list and the student which number was closest to this number is selected to be the first student in the sample (random start).
- In order to select the next student, number A was added to number B to get number C.
- Then number C was compared with the number of students in the list and the student which number was closest to C is selected.
- The procedure went on, until all students were selected and the procedure was repeated again for Grade 3 students.

In order to protect the anonymity, each student received a unique code comprised of: unique number of the school, language in which the test would be administered (Macedonian or Albanian), number of the class and student's number in the registry.

It was decided to test 1,000 students in Grade 2 and 1,000 students in Grade 3 with the language instrument and the same students to be assessed again with mathematics instrument.

Table 1 below provides a breakdown of selected students per category following the sample selection procedure.

Table 1. Number of students per grade and language of instruction in the sample

Grade Language of instruction	Grade 2	Grade 3	Total
Macedonian	754	758	1512
Albanian	256	253	509
Total	1010	1011	2021

2.4 Instrument structure

After the pilot study, it was decided to keep the same structure of the instruments, but to incorporate the lessons learned regarding the background questions as well as to modify the instructions as necessary.

Background questions section

Because the same cohort of students participated in both literacy and numeracy assessment, the background information was collected only during EGRA administration and was then linked with EGMA assessment only through the student ID number.

The tangerine wizard automatically recorded the date (year, month, day) and time of assessment, the name of school, its location (urban/rural), place, municipality and region. Each student was assigned a unique ID number during the selection procedure (same for EGRA and EGMA), which was entered prior to the test administration.

Following the pattern of EGRA and EGMA implementation in other countries, which featured a contextual questionnaire concerning factors that may affect student outcomes, similar questions were designed to be answered by the students prior to the administration of EGRA tool. These background questions included:

- Type of the school the student attends (central or satellite): satellite schools are located in rural areas, so even if the central school is listed as urban, the data of the students from satellite schools should be considered as rural;
- Grade of the student (second or third);
- Gender of the student (male or female);
- Language of instruction (Macedonian, Albanian, Turkish or Serbian);
- Education of the mother (primary or less, secondary or higher and more);
- Education of the father (primary or less, secondary or higher and more)
- Age of the student;
- Language spoken at home (Macedonian, Albanian, Turkish, Romani, Serbian or other language): in this question it was possible to mark two and more options for students from multilingual families;
- Attendance of preschool;
- Availability of additional books at home;

- Habit of reading together with family members (mother, father, both parents, siblings, grandparents, someone else).

This section of the instrument was also used to start conversation with the students and establish rapport, which is an important task in oral, one-on-one testing.

General Instructions
The instructions from the original instrument were carefully reviewed, paying close attention to the clarity of the instructions for both students and assessors. To the extent possible, student instructions were made to be consistent (including ways to encourage the child without helping him with the task, number of examples, etc.) across each of the test subtasks.

For all EGRA and EGMA tasks, a practice item was introduced, so the students could easily understand what is required of them and the feedback provided by the assessors could tell them whether they are on the right track.

Specific instructions
As to the specific instructions in the tasks, the following decisions were made:
- **Guiding the children along the subtask**. Most children showed a natural tendency to point at tasks and numbers themselves. The assessor is to show what the order of solving the tasks is, but does not need to glide his/her hand along the numbers and tasks.
- **Mistakes made in the example.** If children make a mistake doing the example, the assessor is allowed to ask something like: Are you sure? If the child makes a mistake again, the assessor is to say what the correct answer is, but he/she is not to guide the child in any way to the correct answer.
- **Mistakes made doing the subtasks.** If the child makes a mistake in one of the subtasks and later wishes to revise its answer, the assessor will accept and register the new answer and code it as correct or incorrect as the case may be, but should not correct the mistake or guide the student towards the right answer.
- **Asking for repetition of the (instruction to a) subtask.** Notably in the case of word problems, children may ask for the subtask to be repeated. In such cases the complete task will be repeated and not the key passage(s), only.
- **Children wanting to see/read the subtask.** Assessors must not show the text they are reading out to the children. This issue may arise in the word problems, when children want to see/read the text of the word problem. This is not to be allowed.

Timing
Time-limitation of subtasks is useful in making the assessment shorter, and is also less stressful for both child and assessor, as the child does not have to keep trying to do the whole task at a slow pace. In addition, timing helps to assess automaticity. More details on timing and stop rules of all tasks is provided below in the EGRA and EGMA sections.

3. OVERVIEW OF EARLY GRADE READING ASSESSMENT

3.1 Purpose of EGRA

The Early Grade Reading Assessment (EGRA)[6], is an instrument developed by RTI International with support from the World Bank and the United States Agency for

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[6] *EGRA: Early Grade Reading Assessment (RTI International for U.S. Agency for International Development [USAID]). For instruments and reports, see: www.eddataglobal.org.*

International Development (USAID), to assess the main skills that are known to predict reading success within the early grades of primary school (first to third grade).

In Macedonia, two Work Groups, comprised of five local experts in Macedonian and six local experts in Albanian language led by international consultant Helen Abadzi, adapted the EGRA instrument into the two target languages (Macedonian and Albanian) and developed the most suitable reading subtasks and items for Macedonia's context.

The experts in curriculum development were appointed by the BDE, while the assessment specialists were from the lines of the NEC. The other members of the Work Group included members of teaching colleges and practitioners (pedagogues, psychologists and early grade teachers).

Prior to the baseline study, modifications were made to the tasks and instructions developed for the pilot study to address deficiencies revealed in the pilot assessments. Instructions for each task were also reviewed to assure that they are specific and thorough enough but also understandable for the assessors and especially the children being assessed. Once all tasks and instructions were finalized, they were sent for proofreading.

3.2 The EGRA instrument for Macedonia

After the modification, an EGRA tool for the baseline study had been developed, one version in Macedonian and one in Albanian, as well as one version for Grade 2 and one for Grade 3, with the following components:

- Subtask 1 - Letter knowledge (100 letter combinations)
- Subtask 2 - Familiar word reading (50 words)
- Subtask 3 and 5 - Reading fluency (story of around 100 words)
- Subtask 4 and 6 - Reading comprehension (several comprehension questions).

The recommendations from the pilot study were observed and two texts were created both for Grade 2 and 3 students, so that more comprehension questions were generated to test the reading comprehension among students on a more reliable level.

Subtask 1 - Letter knowledge
In this task, students were asked to provide the name of listed letters of the alphabet in Macedonian and Albanian languages.

The teams of Albanian and Macedonian educators first developed charts with 100 capital and lower-case letters based on the frequency lists of letters for both languages. Letters of the alphabet included in this task were listed in random order in order to assess letter recognition and naming fluency, as opposed to simple alphabet memorization.

The student sheet included 10 lines with 10 letters on each line. The number of letters that were not recognized or were incorrectly identified was marked and entered into the tablet. In the end, the sum of all correctly identified letters within 60 seconds time-frame was recorded. Time taken to read all letters was also recorded.

А	Р	С	и	к	Е	н	Ф	т	А
И	у	В	Х	Л	З	ж	Н	б	Ц
Т	д	Г	И	Ш	В	ч	Е	О	к
Р	В	п	Ј	Т	л	Е	н	З	Б
и	К	љ	м	р	с	Х	О	S	А
т	Н	д	Е	Х	З	Џ	ј	Р	о
С	Р	м	В	б	А	Ж	к	Ч	е
Љ	И	Ц	s	Т	з	Ф	Д	п	Л
ш	Л	Ж	Ј	ќ	О	У	Г	џ	Н
к	Ѓ	А	П	в	Г	ј	Р	М	о

Figure 1. Example of Letter Knowledge Subtask in Macedonian language for Grade 2

D	V	j	u	N	k	b	i	S	o
f	R	q	A	ll	Nj	m	y	Z	dh
rr	X	t	sh	G	ë	ç	L	h	gj
Th	c	p	Xh	e	zh	d	K	n	U
s	L	M	a	r	F	ll	O	nj	Y
J	x	T	Sh	v	xh	K	i	g	z
V	Gj	d	f	Ll	j	Zh	o	S	Ë
e	Q	u	H	Rr	nj	t	m	C	y
X	Dh	a	N	k	B	r	L	i	H
Ç	P	v	th	D	g	U	xh	e	S

Figure 2. Example of Letter Knowledge Subtask in Albanian language for Grade 2

Subtask 2 - Familiar word reading

The second subtask consisted of a list of 50 words for each language (10 lines with 5 words in each language). During the development of items, special attention was paid, the words in Macedonian and Albanian to have same number of syllables thus equalizing the time

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required for reading. The list included 2, 3, 4, 5 and 6-letter words. Designed as such, the comparisons of performance in these two languages can be considered reliable.

Each student was asked to read every word as best as they could and as reasonably fast as they could, within 60 seconds. The assessors were instructed to mark as incorrect all those words that were read in non-acceptable formal pronunciation. If a student read all words in less than one minute, the time taken to complete the task was also recorded and entered, so as to calculate the correct words per minute (cwpm).

The sums of a) all words read irrespective of being correct or not (attempted), and b) all words read correctly within 60 seconds (correct) were also recorded in order to calculate the accuracy of students in reading familiar words.

со	леб	Илир	тесла	летово
поштар	магла	јаде	вол	на
ќе	оди	Неда	прсти	резбар
асфалт	книга	брза	уши	во
еж	син	мува	брада	лисица
Војдан	сонце	мома	цеб	од
ни	прв	Бора	љубов	спомен
жирафа	бурек	мамо	под	на
но	врв	цути	басна	капина
ѕвонец	метар	дада	нос	си

Figure 3. Example of Familiar Word Reading Subtask in Macedonian language for Grade 2

ti	fle	pemë	letër	tabela
domate	klasë	mjek	ura	la
po	tre	Besa	dreri	bateri
liqeni	Marko	krua	dua	ka
ja	gur	lumi	valoj	tavani
Drilon	fabul	hëna	mur	fe
ha	mbi	vera	druri	tigani
jeleku	radio	Tina	unë	ju
ai	sot	dora	treni	flutur
hekuri	Blina	bora	pre	dy

Figure 4. Example of Familiar Word Reading Subtask in Albanian language for Grade 2

Subtask 3 and 5 - Reading fluency

For the reading fluency, two short stories were created. Each story was created in such way to reflect the sentence complexity and vocabulary for the grade level.

The task was timed, so that the correct number of words read per 60 seconds was recorded. The number of words read incorrectly was also recorded and entered as attempted. If a student read the passage in less than 60 seconds, the time taken to complete the task was recorded as well. Typically, oral reading tests are calibrated so as to allow a student reading at somewhere around 60 words per minute or to read the passage in about one minute.

> Еден топол мајски ден мајка ми отиде да ја посети баба. Јас останав со тато. Пред да замине, таа ме замоли да се грижам за нејзиното црвено цвеќе.
>
> Морав да бидам внимателен, тоа беше омиленото цвеќе на мама. Секој ден играв со другарите, но сепак не заборавав да го полевам цвеќето.
>
> Кога мајка ми се врати, го погледна цвеќето и силно ме прегрна. Ветувањето беше исполнето.

Figure 5. Example of Reading Fluency Subtask in Macedonian language for Grade 2

Subtask 4 and 6 - Comprehension questions

Comprehension questions were designed to correlate with the content of the stories. Given that the comprehension questions task was based on the passage text from the reading fluency task, if students failed to read through the end of the passage, the assessors were instructed to ask questions only for the portion of the text that was read.

The assessors were provided in the tablet with several alternative answers for each of the comprehension questions, but were also instructed to use their common sense in assessing whether the answer was correct, as these alternatives were not exhaustive.

The total number of attempted and correct answers was recorded and as such entered into the database, to calculate the accuracy.

Приказна бр. 1		ПРАШАЊА
Еден топол мајски ден мајка ми отиде да ја посети баба. Јас останав со тато. Пред да замине, таа ме замоли да се грижам за нејзиното црвено цвеќе.	28	**1. Кај кого отиде мајката во посета?** - баба - отиде кај бабата на детето - мајката отиде да ја посети бабата **2. За што требало да се грижи детето?** - за цвеќето (на мајката) - за црвеното цвеќе (на мама) - за омиленото црвено цвеќе (на мама)
Морав да бидам внимателен, тоа беше омиленото цвеќе на мама. Секој ден играв со другарите, но сепак не заборавав да го полевам цвеќето.	51	**3. Што правело детето секој ден со цвеќето?** - го полевало (цвеќето) - го наводнувало (цвеќето) - му ставаше/ло вода 4. Со кого си играло детето? - со другарите/другарчињата

		- детето си играло со другарите/другарчињата
Кога мајка ми се врати, го погледна цвеќето и силно ме прегрна. Ветувањето беше исполнето.	66	**5. Зошто го прегрнала мајката кога се вратила?** - затоа што бил добар (или добро дете) - затоа што бил исполнителен - затоа што бил одговорен (одговорно дете) - затоа што ја послушал мајката - затоа што бил умен - затоа што го полевал цвеќето - затоа што му ставал вода (на цвеќето) - затоа што се грижел за цвеќето - затоа што не го оставил цвеќето да овене
		6. Што би се случило со цвеќето ако детето не го исполнеше ветувањето? - (цвеќето) ќе овенеше - (цвеќето) ќе се исушеше - ќе се разочараше мајката - ако детето не го исполнеше ветувањето, тогаш... (сите можни горенаведени категрии) **7. Како се чувствувало детето по прегратката на мајката?** - среќно - задоволно - гордо - радосно - детето во прегратката на мајката се чувствувало... (сите можни горенаведени категории)

Figure 6. Example of Comprehension Questions Subtask in Macedonian language for Grade 2

Timing and Stop Rules, by task
Timing of EGRA subtasks is very important, as students achieve automaticity on the mechanics' of reading – i.e. matching letters and graphemes to sounds to make up words and sentences- they develop fluency in reading, allowing them to read longer texts and focus on the meaning of the text. "Automaticity" means fluency in word recognition so that the reader is no longer aware of or needs to concentrate on the mental effort of translating letters to sounds and forming sounds into words. At that point, the reader is decoding quickly enough to be able to focus on comprehension.

Table 2 breaks down the timing and stop rules in place for each of the EGRA tasks applied in Macedonia in both grades.

Table 2. Timing and stop rules for EGRA tasks

Task	Timed		Stop rule	
	Grade 2	Grade 3	Grade 2	Grade 3

Letter knowledge	60s	60s	3s	3s
Familiar word reading	60s	60s	3s	3s
Reading fluency	60s	60s	3s	3s
Reading comprehension	No	No	15s	15s

4. OVERVIEW OF EARLY GRADE MATHEMATICS ASSESSMENT

4.1 Purpose of EGMA

EGMA consists of a number of subtests developed in response to the extensive research literature on early mathematics learning and evaluation. In addition to being aligned with the core competencies identified in a wide range of international curricula (from both developing and developed countries) the subtests represent a progression of skills that lead toward proficiency in mathematics. Furthermore, they systematically sample and test skills required during the early years and, in so doing, provide an indicator of needs for intervention.

The development of the EGMA tool was aimed to measure the extent to which school children in the early primary grades are learning mathematics and, more specifically, numbers, operations, and geometry skills. Thus, a key design feature in EGMA was to make sure the tool had some tasks that are easy, such as oral counting; and that the tasks in the assessment progress and build on this knowledge. Oral counting fluency and number identification are known as "gateway skills" and are comparable to letter-naming fluency measures in assessing reading ability. Quantity discrimination and missing-number identification involve additional knowledge of mathematical relationships and are indicators of mathematical knowledge.

The instrument is a simple tool applied to determine a student's understanding of essential foundational math skills in the following:

- level of understanding of whole numbers (e.g., ordering, adding, subtracting);
- an understanding of patterns, such as pattern extension in numerical and/or geometric sequences;
- recognition of both two- and three-dimensional shapes;
- ability for solving multistep word problems.

Some of the EGMA tasks were timed, as automaticity (i.e., quick and effortless recall of facts) is also emphasized internationally. The details on timing and stop rules are provided in the next section.

4.2 The EGMA instrument for Macedonia

The group involved in the EGMA adaptation process was comprised of six specialists in numeracy/mathematics curriculum and assessment as well as school practitioners led through the process by international consultant José Noijons.

At the initial workshop the content of the EGMA tool was adapted to the Macedonian context, some new content was generated, while general and specific test instructions were reviewed. EGMA team developed four versions of the instrument, one of which was used during the

pilot study and another one, with slight modifications to the instructions, was used for the baseline study.

The subtasks in both Macedonian and Albanian versions were the same, only the instructions and the word problems subtask were translated in both languages.

Per the Macedonia curriculum, students in grade 2 should demonstrate number knowledge for numbers 0 through 20. Students in grade 3 should demonstrate number knowledge for numbers 20 through 100. The subtasks were designed in line with these curriculum requirements.

The list of selected subtasks for EGMA instrument for Macedonia and brief explanation of each of them is provided below.

- Subtask 1 – Number Identification
- Subtask 2 – Number Discrimination
- Subtask 3 – Naming Missing Numbers
- Subtask 4 – Addition
- Subtask 5 – Subtraction
- Subtask 6 – Word Problems
- Subtask 7 – Geometric Shape Recognition
- Subtask 8 – Geometric Pattern Extension

Subtask 1 - Number Identification
In this task student knowledge and identification of written symbols is assessed. The workgroup was aware that the system of naming numbers differs in the Macedonian and Albanian languages. However, this is done in a similarly systematic manner and it was not felt that this task was more difficult in one or the other language. For the number identification task, students were shown a stimulus page with two rows (three in Grade 3) and five numbers in each row. Students were asked to point to each number and tell the assessor the number name. This task was timed for 60 seconds.

2	9	16	11	13
20	15	7	4	18

Figure 7. Example of Number Identification Subtask for Grade 2

Subtask 2 - Number Discrimination
Student ability to make judgments about differences is assessed in this task by having them compare quantities in object groups. Identifying the bigger number is an important precursor to addition and subtraction. For the quantity discrimination task, students were shown two numbers at a time and asked to tell the assessor the number name of the bigger number. The subtask included five items for grade 2 and seven items for grade 3.

4	**7**
14	**17**
17	11
15	13

19	16

Figure 8. Example of Number Discrimination Subtask for Grade 2

Subtask 3 - Naming Missing Numbers
In this task student ability to name a missing number in a set or sequence of numbers is assessed. This task is used to evaluate children's familiarity with number sequences and test children's in-depth knowledge of the numbers they are working with through their ability in counting by ones, twos, fives, and tens. There are five subtasks in the Grade 2 and 10 subtasks in the Grade 3 instrument. This section is timed to 120 seconds only for Grade 3 students, to avoid an undue lengthening of the testing time (and an undesired loss of concentration). For the missing number task, students were shown a stimulus page, and asked to tell the assessor the missing number.

5	6	7	[8]
12	14	[16]	18
13	[14]	15	16
[9]	11	13	15
5	10	15	[20]

Figure 9. Example of Naming Missing Numbers Subtask for Grade 2

Subtask 4 and 5 - Addition and Subtraction
In these tasks student ability to solve addition and subtraction problems is assessed through single-digit, double-digit, and single- or double-digit-with-carryover tasks. This section was timed: ten subtasks in 60 seconds for both grades. Because the section is timed it was made sure that the two types of problems were offered randomly, that is to say that items with carryover tasks were not presented after the easier tasks, as is done in the core EGMA.

1 + 6 = **(7)**
10 + 4 = **(14)**
4 + 6 = **(10)**
2 + 7 = **(9)**
4 + 3 = **(7)**
16 - 10 = **(6)**
7 - 5 = **(2)**
14 - 5 = **(9)**
9 - 3 = **(6)**
18 - 5 = **(13)**

Figure 10. Example of Addition and Subtraction Subtasks for Grade 2

Subtask 6 - Word Problems: addition/subtraction & multiplication/division (orally)

In this section student informal concepts of addition and subtraction (Grade 2) and of addition, subtraction, multiplication and division (Grade 3) are assessed. Word problems give children exposure to strategies and flexibility in solving realistic problems. In the Grade 2 test, two tasks tapped addition and two tasks tapped subtraction. In the Grade 3 test there is a task for each of the four operations: addition, subtraction, multiplication and division. This section is timed at four minutes to not unjustifiably exhaust the weaker students and to keep the test within the time limit of 15 minutes. If children would ask for the word problem task to be repeated, it was decided that in such cases the complete problem would be repeated and not the key passage(s), only. It was not allowed for children to see/read the text of the word problem.

Учениците од второ одделение собирале книги за училишната библиотека. Колку вкупно книги собрале ако во месец март донеле 8, а во месец април 7 книги?

Точен одговор: 15

Nxënësit e klasës së dytë mblidhnin libra për bibliotekën e shkollës. Sa libra gjithsej kanë mbledhur nëse në muajin mars kanë sjellë 8, kurse në muajin prill 7 libra?

Përgjigje e saktë 15

Figure 11. Example of Word Problems Subtasks in Macedonian and Albanian language for Grade 2

Subtask 7 - Geometry: Shape Recognition
In this section student ability to identify and select specific shapes is assessed (circles, squares, rectangles and triangles). Four tasks are given to both grades, not timed. It was found that the students liked this task and it was something of a relief after the rather difficult word problem section. From a test acceptance point of view this is a good phenomenon: the test taker should not experience the test as too stressful.
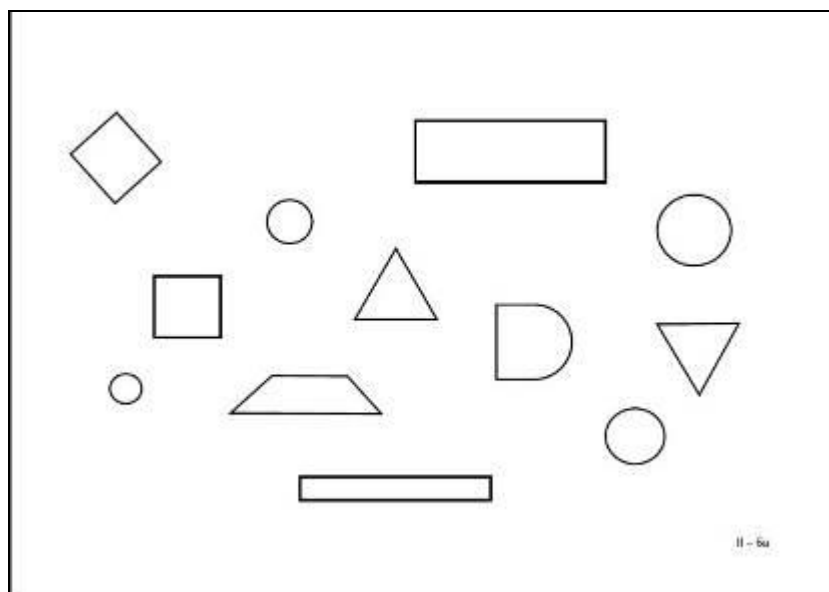
Figure 12. Example of Shape Recognition Subtask for Grade 2

Subtask 8 - Geometry: Pattern Extension

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In this task student ability to identify similarities and differences among objects that make up a pattern is assessed. It was noted that this ability was not mentioned in the curriculum for Grade 3 (it *is* mentioned for Grade 2). There are three items for Grade 2 and four items for Grade 3 in this untimed section.
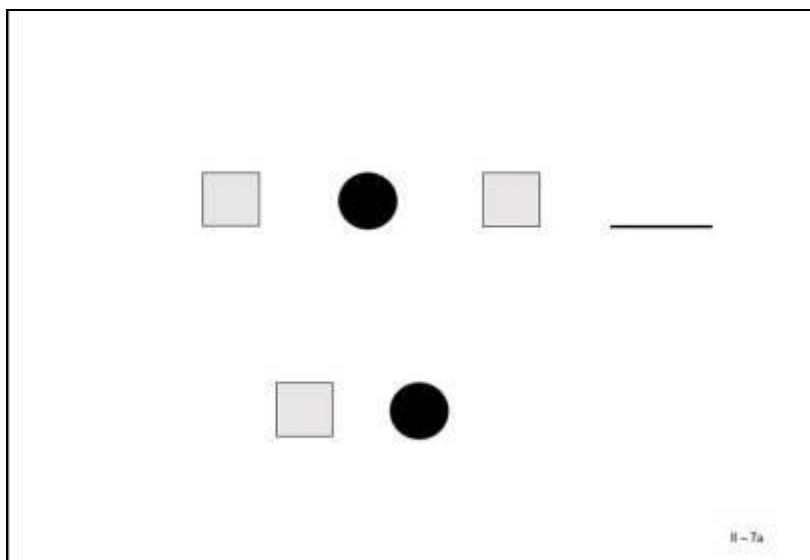
Figure 13. Example of Pattern Extension Subtask for Grade 2

Counting Strategies
The counting strategies used by children were observed during the addition and subtraction as well as word problem tasks. For this purpose, counters or manipulatives as well as paper and pencil were provided to students for doing the necessary calculations. The children were also allowed to use their fingers. After each task, the assessor was asked based on the observations to record the type of strategy used by the student (e.g., counting fingers, using counters, writing down on paper or mental calculation).

The observation and analysis of strategies used cannot be discounted, especially if we are to learn where children may be struggling in their calculations for these types of problems. By capturing strategies that are being used, teachers can learn from the errors or the children's level of efficiency in solving addition and subtraction problems.

Timing and Stop Rules, by Task
Studies with school-age children have demonstrated the importance of using a timing method on mathematics tasks as a way to reveal differences in the processing of numerical information. Furthermore, this method provides information in addition to accuracy scores. Both accuracy and speed are tested based on the time it took each child to complete each task (timed from when the child started the task to when the child finished the task).

Timing of some of the tasks is vital to establish fluency, to reduce the time taken to complete the assessment, and to relieve the stress children might feel in trying to perform a task unsuccessfully for an indefinite period of time. Children sometimes see the fact that the assessment is timed as making it more of a game.

To ensure that children do not get fatigued or overwhelmed and to learn of their ability for each of the tasks, a universal stop rule has been put in place. This stop rule applies to all of the tasks, timed or with current stop rules. The rule is: If a student gets the first four items

incorrect, one after the other, the assessor should stop the student and move on to the next task. However, each task must be attempted.

Table 3 breaks down the timing and stop rules in place for each of the EGMA tasks applied in Macedonia in both grades.

Table 3. Timing and stop rules for EGMA tasks

Task	Timed		Stop rule	
	Grade 2	Grade 3	Grade 2	Grade 3
Number identification	60s	60s	5s	5s
Number Discrimination	No	No	4 consecutive errors or 5s	4 consecutive errors or 5s
Naming Missing Numbers	No	120s	4 consecutive errors or 5s	4 consecutive errors or 5s
Addition	60s	60s	10s	10s
Subtraction	60s	60s	10s	10s
Word Problems	No	4min	4 consecutive errors or 10s	4 consecutive errors or 10s (1min if it uses manipulatives)
Geometric Shape Recognition	No	No	No	No
Geometric Pattern Extension	No	No	No	No

5. FIELDWORK AND DATA COLLECTION PROCESS FOR EGRA & EGMA

5.1 Training for Administration of EGRA and EGMA Tools

Assessors responsible for administration of EGRA and EGMA instruments in the schools have a substantial influence on the quality of any EGRA and EGMA implementation. The second batch of assessors included the pedagogues and psychologists as well as several teachers working in the 21 phase 2 schools. Additionally, following the recommendations from the pilot study, school directors and assessors from pilot schools were contacted in order to nominate additional assessor from the schools in which only one staff member was trained for administration of the instruments. The training was delivered by the project team members.

The training for second group of 49 assessors was held from March 31 to April 2, in Ohrid. Based on the findings from the participants' evaluation forms from the previous training who said that it was too long, the five-day training was reduced to three-day training, taking special care not to reduce the most important parts – inter-raters' reliability and practical work with tablets.

The training topics included presentation of methodology for development of EGRA and EGMA instruments and design of all subtasks, procedure for selection of students in the sample, review of roles and responsibilities of supervisors and assessors, use of EGRA and EGMA on tangerine application and hands-on practice on tablet computers and test for inter-rater reliability.

The procurement of more tablets, to be used during the training process, proved to be useful, as all participants simultaneously tried the tests, and had a lot of questions regarding the

work on tablets. The second day, after the participants got some experience with the tablets, was also used to have a look at inter-rater reliability for both EGRA and EGMA test. The following steps were taken to measure reliability across the assessors:

- The trainer prepared responses (correct and incorrect) for each of the tasks that make up the EGRA and EGMA;
- Tablet was used for the assessors to record the responses;
- One participant played the role of the assessor and another one played the role of a child using the prepared responses by the trainer;
- As the "child" read the prepared responses, the assessors entered the responses in the tablets (including the application of stop rules where needed);
- The results were uploaded to the cloud and the project team downloaded and cleaned the data, and presented them to the participants in an Excel sheet. This data was used to look at the most common problems and mistakes of the assessors.

On the final day of the training, the main points and most common mistakes in using the tablets were highlighted and all logistical issues and preparations for the baseline study were discussed, such as providing a separate, quiet room for administration of the instrument, instructions on how to work with young children, how to handle the tablets in the school, etc.

The most common comments of participants were that each assessor should have own tablet and certificates should be provided for trained assessors.

It was agreed BDE and NEC staff, Step by Step educational coordinators and members of the Work Group who participated in the adaptation workshop to resume the role of observers, with a responsibility to observe the administration process for the duration of field work.

Two instruction manuals prepared for the pilot study were modified to serve as a helpful resource for assessors and observers in the schools.

The first manual for administration of EGRA and EGMA tools presented the two instruments and their subtasks as well as the general procedures for their administration. Furthermore, it provided specific instructions for EGRA and EGMA subtasks for second and third grade students, how to mark the responses of the students, how to use the student worksheets and counters for math tests, and how to use the stop rule. The final part of this manual was focused on the tangerine application and use of the tablet computers, the process of logging in and out, the basic settings, data gathering, using the automatic stopwatch, saving and synchronizing the data and other useful recommendations for the testing process.

The second manual was focused on quality assurance during the testing process and was intended for the observers. It outlined the main responsibilities of observers, their specific role in the school, the way of recording and reporting their observations.

5.2 Data collection

Data collection took place between May 19 and June 3, 2014 and was carried out by 83 assessors, comprised of pedagogues, psychologists and/or selected early grade teachers that were trained to take the role of assessors.

The baseline study was conducted with a sample of 2,021 students from Grade 2 and Grade 3, with Macedonian and Albanian language of instruction in the 42 pilot and phase 2 schools.

In addition, ten students from the special primary school "Maca Ovcharova", selected by their educators, were assessed in order to test how the children with special educational needs respond to the tasks in the instruments. The selected children had different level of physical and/or intellectual disabilities. Two students from Grade 2 and five students from Grade 3 were assessed with EGRA and EGMA instruments for Grade 2 (ranging from 9 to 11 years of age), while one student from Grade 4 and two students from Grade 5 were assessed with the instruments for Grade 3 (from 10 to 14 years of age).

The project team prepared the correct number of laminated student stimuli sheets in Macedonian and Albanian language that were delivered to the schools through mail four days prior to the start of the data collection process. This was also done in consultation with experts from the National Examinations Center, so that the assessors had enough time to familiarize with the new content of the tasks and modified instructions.

The assessment process involved a 10- to 20-minute, individual, oral assessment between the student and the EGRA and EGMA assessor. Depending on the size of the school and the language of instruction (Macedonian only, Albanian only or bilingual), assessors conducted the assessment, with around 20 to 120 students per school. The data were recorded electronically via the Tangerine application and sent by the assessors directly to the central database.

As data collection using Tangerine required Internet access for backing up data and saving them on the cloud, in some instances this created a problem, because data upload and download is restricted in almost all schools in Macedonia, so the assessors or school directors had to take the tablets at home in order to be able to save the data in the central database.

Selected observers as well as the project team visited the schools regularly to verify the completeness and clarity of the assessment process.

After the technical difficulties and lessons learned from the tablet computers procured for the pilot school, the procurement of new batch of tablet computers Google Nexus proved to be of better quality in terms of their performance. Few problems were detected mainly with malfunction of the chargers. Only one of the Ainol tablets procured in the pilot phase was sent back to the supplier for repair (this tablet was already repaired once during the pilot study). Fortunately, no data were lost from the tablets, which is very important factor for sustaining the quality of the sample and study design.

Once the data collection process was finalized, the Literacy and Numeracy Assessment coordinator extracted the data from the cloud, cleaned the missing data and sent them to Beti Lameva from NEC for analysis.

5.3 Quality Assurance

Quality assurance of collected data is very important for obtaining valid and reliable data. For the baseline study, observers from the ranks of NEC advisors, professors from teacher colleges and practitioners from the Work Groups that developed the instruments as well as Step by Step educators were tasked to oversee the assessment process and ensure the quality of the collected data. They also had to ensure compliance with standardized procedures and protocols for the administration of the EGRA and EGMA instruments.

BDE advisors who participated as observers in the pilot study were also planned to take this role in the baseline study as well. For this purpose, the plan of activities for the baseline

study was sent to BDE director in April. However, because of the busy schedule of BDE advisors in this period of the school year, they were not able to participate in the baseline study as observers.

The assessment protocol used in the pilot study was slightly modified based on the lessons learned so that the observers could easily monitor the quality of the assessment process, tracking any changes in the standard administration procedures and instructions.

Some of these standards incorporated into simple checklists included:
- The anonymity of students and their results must be protected.
- Rapport should be built with each student before the beginning of the test in order to make the children feel comfortable and relaxed during the test so that they can perform at their best.
- Consistency in administration of instruments should be observed, to offer every child the same opportunity to perform.
- The script of the instructions and administration rules should be respected.

Total of 20 observers conducted 75 school visits to monitor the data collection. The newly recruited observers from NEC attended a workshop on the implementation of EGRA and EGMA tools, so they could be familiar with each task and instructions in the instruments.

The project team was also mobile, visiting schools and providing the necessary assistance. In two instances, NEC advisor Aferdita Saracini administered EGRA and EGMA instruments in two schools with students attending classes in Albanian language, where no Albanian speaking assessor was trained due to the small number of students in this language. Total of 16 students were assessed in primary schools "Elpida Karamandi" – Bitola (satellite school in Dolenci village) and Goce Delcev – Aerodrom (Gorno Lisice village).

Each observer had to submit a report with observations from the assessment process. The main findings from the reports about the testing conditions and process are the following:

- "Sound insulation" in classroom, pedagogue/psychologist's office or school library where administration of assessments took place was not optimal for smooth administration of the assessments, especially because of the noise during the breaks.
- Regarding the "Visual surrounding", in some instances it was not satisfactory, (usually not enough space, too much technical equipment in the classroom - computers, laptops etc.), so in few cases it did not allow the students to fully concentrate and pay attention to the tasks.
- In most of the schools, "the ambience in the room" was on satisfying level where students could feel cozy and relaxed.
- Most of the assessors established good rapport and communication with the students and they had excellent pedagogical approach with students.
- In most of the schools the materials were ready and in place before each assessment.
- In some of the schools the assessment process was interrupted on multiple occasions because school representatives (teachers, director) were entering the classroom, even though in most cases the classroom/office was labeled with special sign "Assessment in progress, do not disturb". Also lack of time of the assessors followed by their engagements in other ongoing school activities in same time, influenced on the assessment process in terms of interruption of the process. In most of the schools assessors did not stop the assessment process during the students recess (lunch break).

- In few cases assessors had problem with unresponsiveness of the tablet computer touch-screen and difficulties during data entry;
- Some of the assessors repeated the instructions more times than allowed and failed to read the full text with instructions (word to word);
- Small number of assessors were leading the student toward the correct answer.

The recommendations from the observers can be summarized:
- Assessors should stop with administration of the instruments during the students recess (lunch break) in order to prevent any disturbances of the process;
- Most of the observers noted that in EGMA subtask 3 "Naming missing numbers" instructions need to be revised because in many cases the assessors were providing additional instructions for students;
- More practice is needed with tablet computers. Assessors who participated in the pilot study were more reliable and experienced in data entry than the assessors included for the first time in baseline study;
- Administration of EGRA and EGMA instruments should be organized and implemented earlier than May in the school year, because school assessors are engaged in many activities at that time of the year (preparations for external testing, enrollment of first graders).

The observers that monitored the assessment process in the special primary school "Maca Ovcharova" – Veles suggested preparation of new instructions only for students with special needs and further modification of EGRA and EGMA assessments (no time limitation for the subtasks) so that these students could be able to respond.

5.4 Data analysis and reporting

The actual data analysis was done by Beti Lameva from the National Examinations Center.

The analysis and reporting of results from EGRA and EGMA present the student performance in reading and mathematics and examined differences by gender, language of instruction, location of school and education of parents.

Licensed TiaPlus[7] and SPSS software were used for data analysis.

The following outputs were obtained with TiaPlus:
- Frequency distributions for each subgroup-subtest combination – where each entry in the table contains the frequency or count of the occurrences of values within a particular group or interval, and in this way, the table summarizes the distribution of values in the sample.
- P-value, which represents a measure of average 'difficulty' (or 'easiness') for the (sub)test. It is normally obtained by dividing the average test score by the maximum possible test score and multiplying this by 100. Can be understood as the proportion (x 100) of persons selecting the correct item answer. Indicating the difficulty of the item. The higher the P-value the easier the item.

Based on the student results, individual school reports will be prepared and distributed to each school. For project purposes, the schools will be ranked by their performance using the average scores (p-values) for all tasks in Macedonian and Albanian. This section is

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[7] TiaPlus is a 32 bits Windows computer program for Test and Item Analysis (TIA for short), focused on "classical" test and item analysis developed by Cito, one of the world's leading testing and assessment companies, based in the Netherlands.

developed for internal purposes only to guide the focus of remedial interventions and to indicate which schools deserve more attention.

6. EGRA & EGMA FINDINGS

This section presents summary statistics for all subtasks of the EGRA and EGMA assessment in Macedonia.

6.1 Characteristics of Sample

The breakdown of sample of students taking EGRA by grade, language of instruction, location of the schools and gender is presented below, showing a balanced sample in both grades according to all three features.

Approximately 75% of the samples students attend classes in Macedonian and 25% in Albanian language of instruction. Majority of students (76%) are from central schools, while 24% from satellite schools. Almost equal percentage of male and female students are included in the sample.
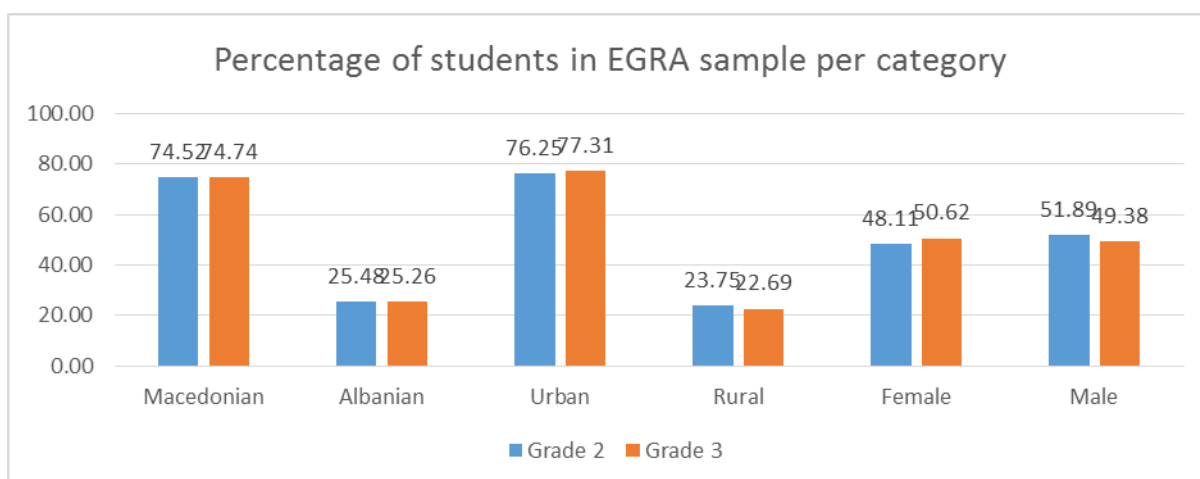
Figure 14. Percentage of students in EGRA sample per grade, language of instruction, location of the schools and gender

The distribution of students in different categories may vary in EGMA sample a little, because some students were absent during the testing time and were not able to take the test, but it is still balanced in both grades according to all three features.
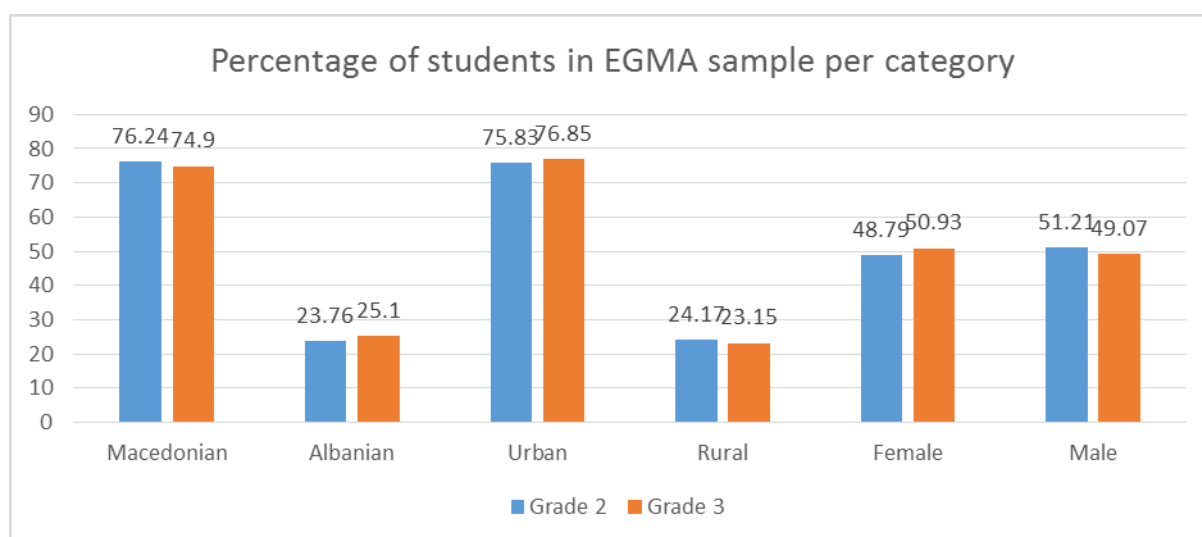
Figure 15. Percentage of students in EGMA sample per grade, language of instruction, location of the schools and gender

6.2 How Well Are Students Reading in Macedonian and Albanian?

The comparison of results between EGRA in Macedonian and in Albanian language in Grade 2 shows that students in Macedonian language of instruction perform better than those in Albanian language in all tasks except for the letter knowledge task.

The students in both languages have best results in the letter knowledge subtask (73% in Macedonian and 75% in Albanian language), while the worst results are in the reading comprehension (46% of students completed this task in Macedonian and 36% in Albanian language).
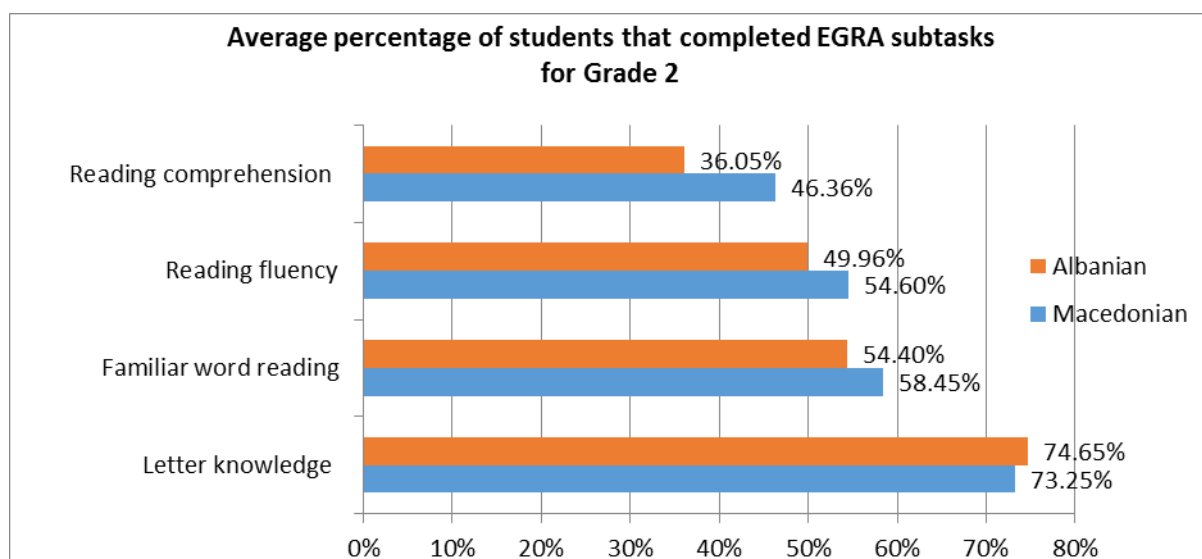
Figure 16. Average percentage of students that completed EGRA subtasks for Grade 2

In Grade 3, students with Macedonian language of instruction outperform the students in Albanian language of instruction on all EGRA tasks. Again the best results are shown in the letter knowledge (82% in both languages) and worst results in reading comprehension (62% in Macedonian and 50% in Albanian language).
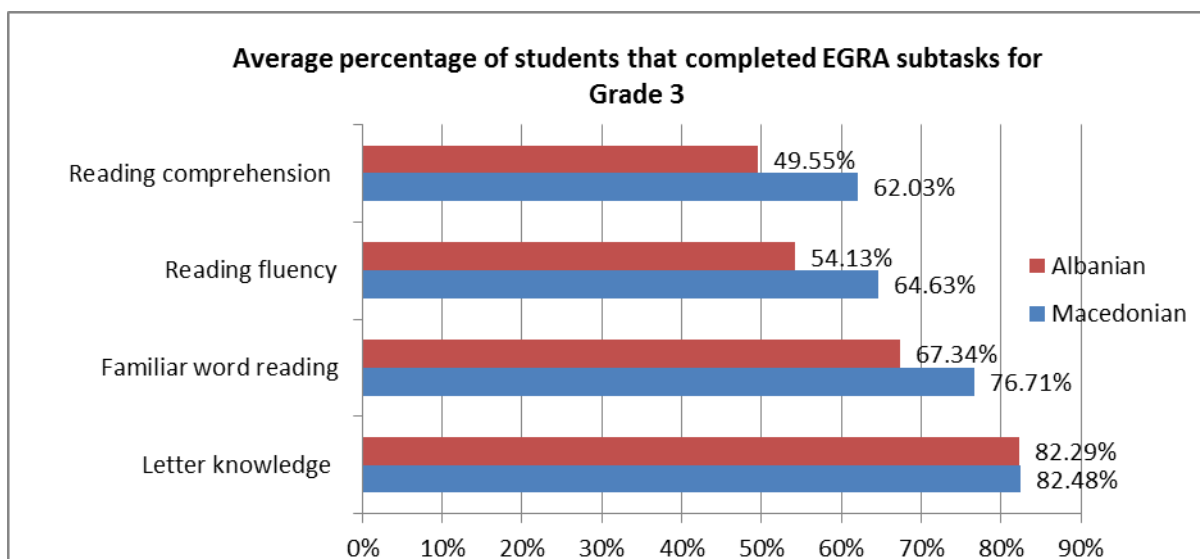
Figure 17. Average percentage of students that completed EGRA subtasks for Grade 3

6.2.1 Results according to gender

In the overall test results, female students tend to perform better than male students in both languages of instruction for Grade 2. The overall score in Macedonian language of instruction is 62% for the girls, compared with 60% for the boys, while in Albanian language it is 58% for girls compared with 57% of the boys.
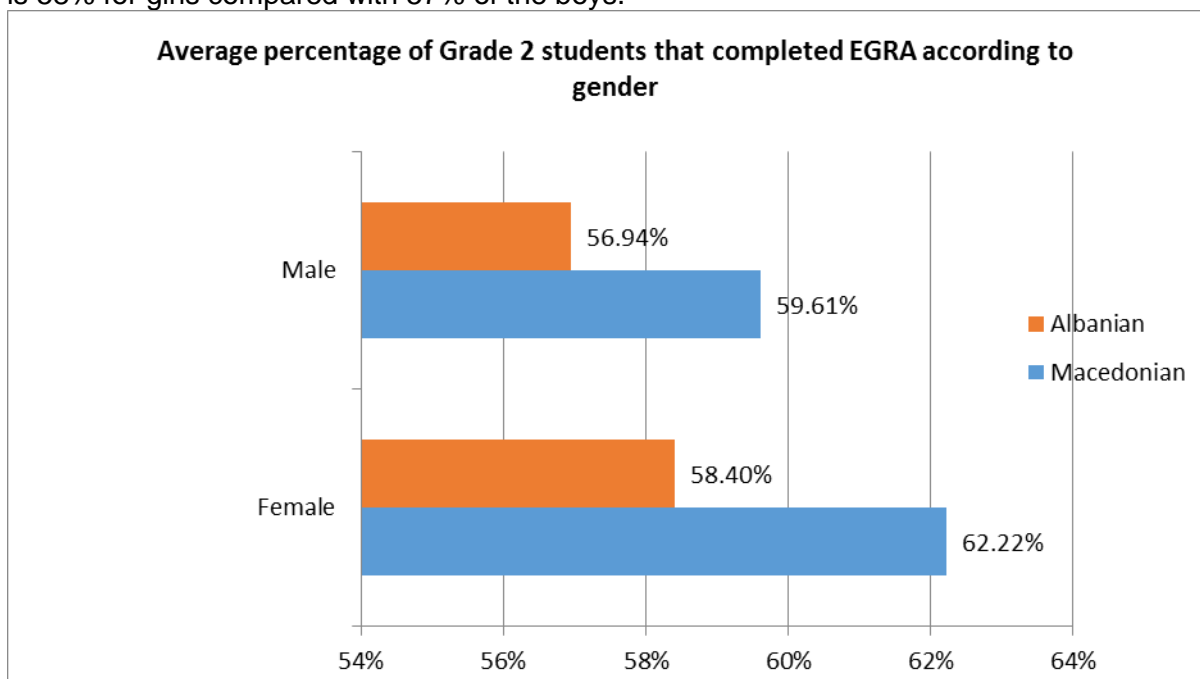
Figure 18. Average percentage of Grade 2 students that completed EGRA according to gender

The same trend is evident among students in Grade 3, where again female students are better than male students (73% vs 68% for Macedonian language of instruction and 64% vs 62 for Albanian language of instruction).
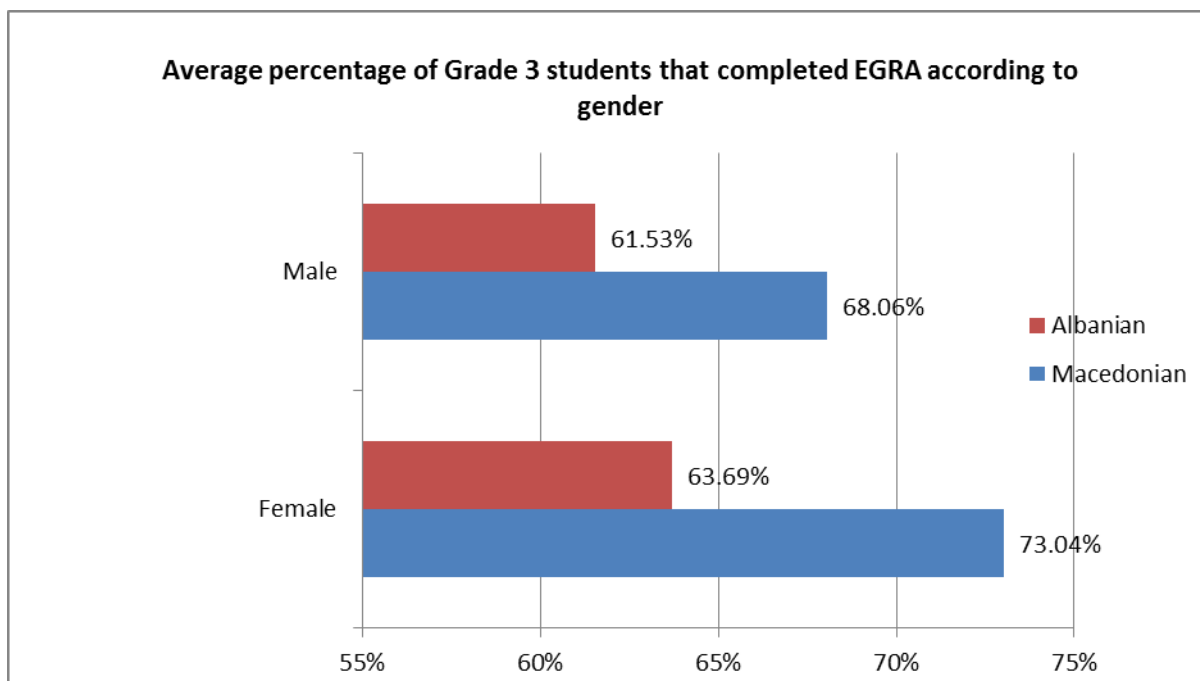
Figure 19. Average percentage of Grade 3 students that completed EGRA according to gender

When the test is broken down by subtasks, for the students with Macedonian language of instruction girls are slightly better than boys in all EGRA subtasks in Grade 2. Again the best results are achieved in letter knowledge and worst in reading comprehension.
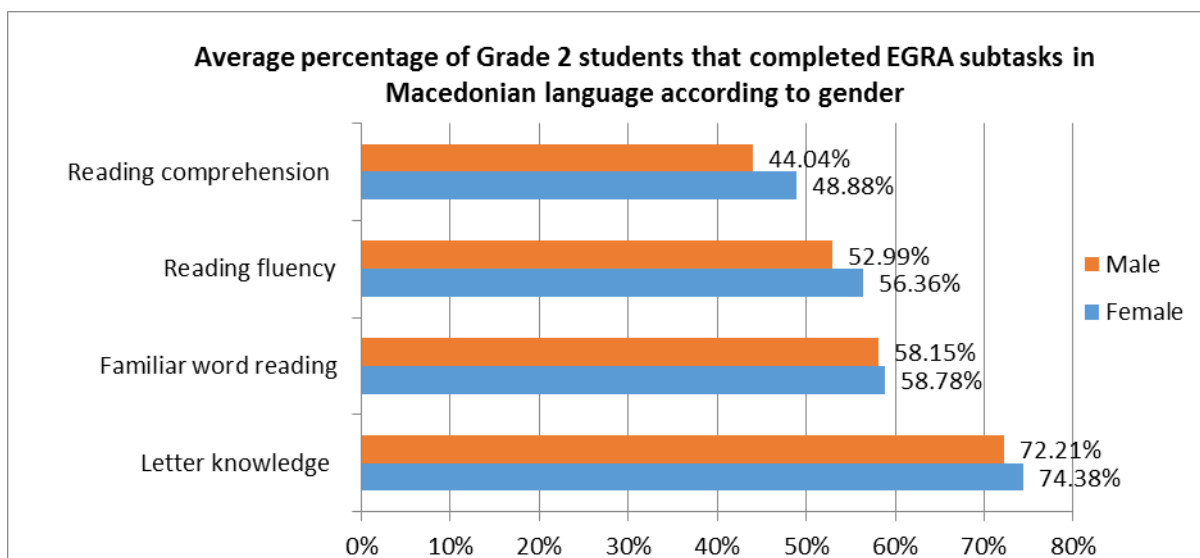
Figure 20. Average percentage of Grade 2 students that completed EGRA subtasks in Macedonian language according to gender

In Albanian language of instruction in Grade 2, male students are better in letter knowledge and familiar word reading subtasks, while female students are better in reading fluency and comprehension subtasks.
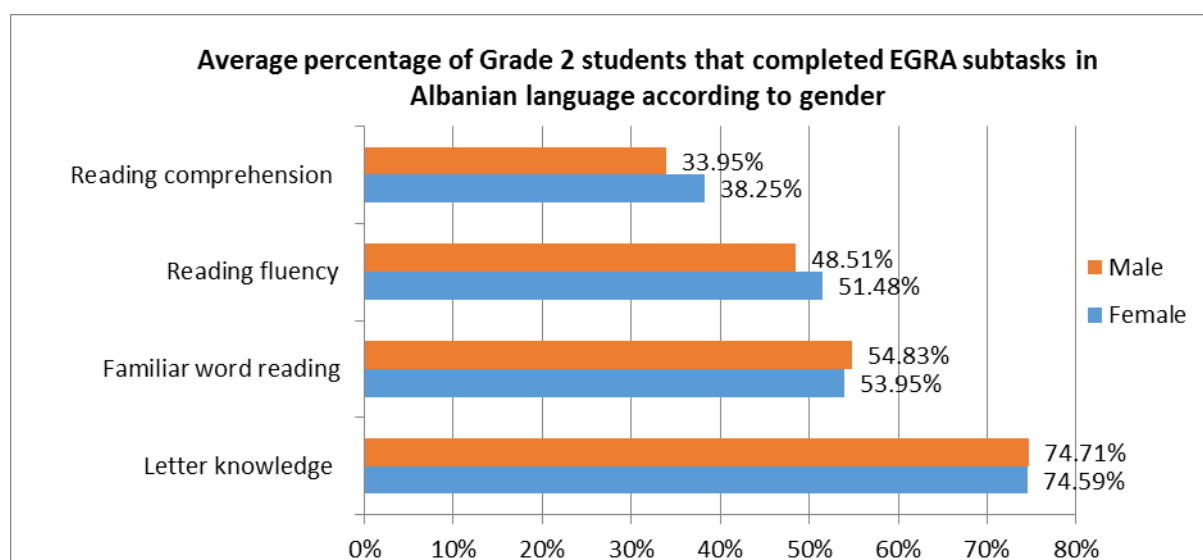
Figure 21. Average percentage of Grade 2 students that completed EGRA subtasks in Albanian language according to gender

In Grade 3, the same trend continues among the students with Macedonian language of instruction, where girls score better than boys. Letter knowledge is still the task where best results are achieved (around 83% for both boys and girls) and reading comprehension is the task with worst results (65% for girls and 58% for boys).
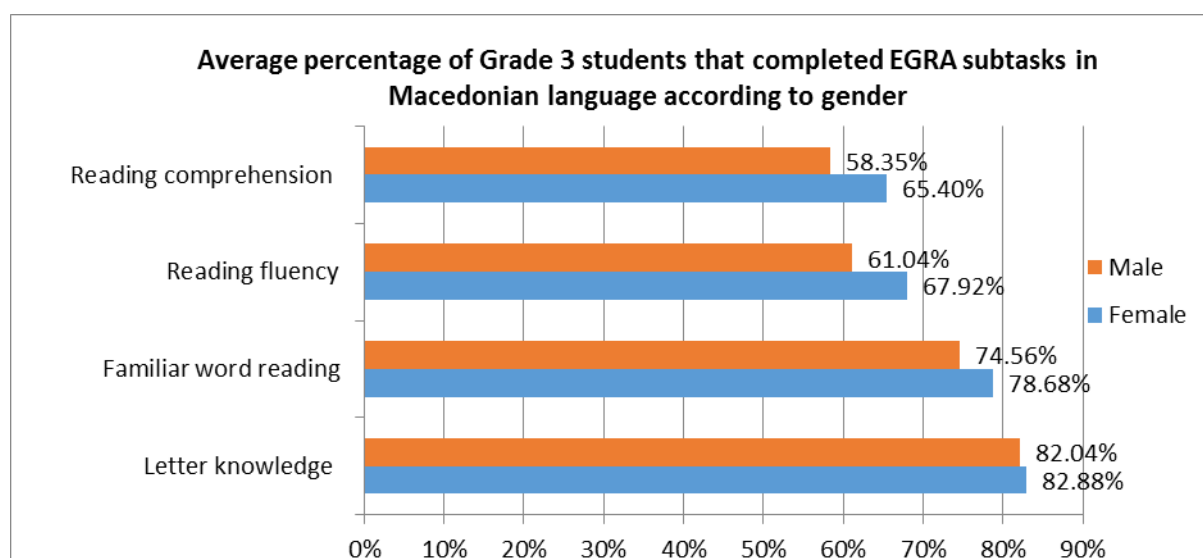
Figure 22. Average percentage of Grade 3 students that completed EGRA subtasks in Macedonian language according to gender

For the Albanian language of instruction, female students in Grade 3 show better results than male students.

Average percentage of students that completed EGRA subtasks according to gender

Reading comprehension — Male 46.70%, Female 52.91%
Reading fluency — Male 53.16%, Female 55.28%
Familiar word reading — Male 66.21%, Female 68.67%
Letter knowledge — Male 81.67%, Female 83.02%
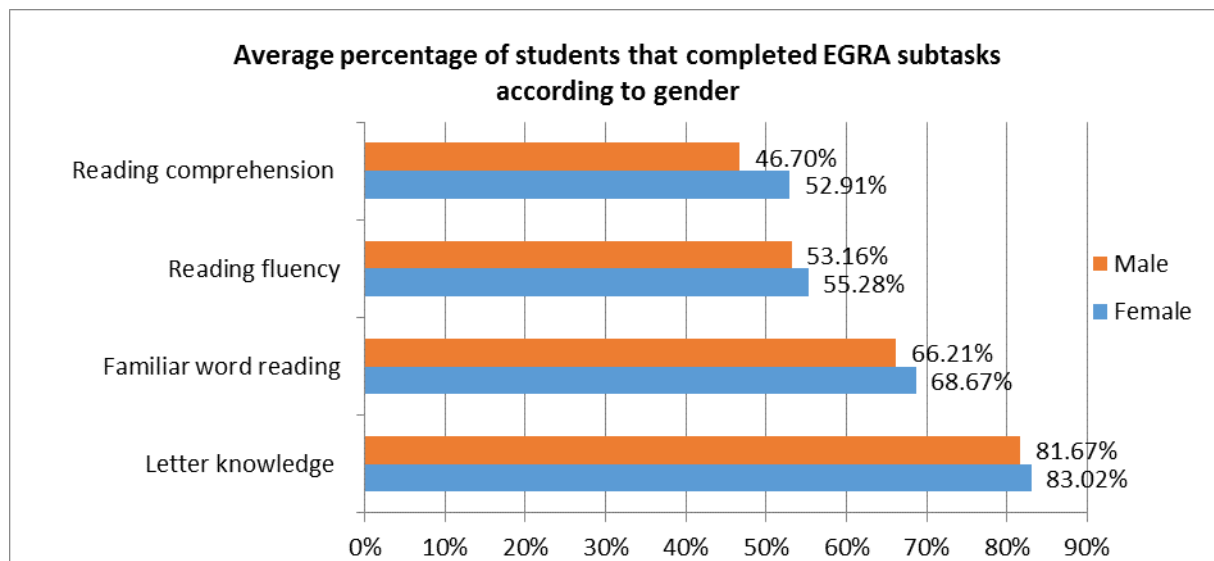
Figure 23. Average percentage of Grade 3 students that completed EGRA subtasks in Albanian language according to gender

6.2.2 Results according to education of parents

Based on the level of education of parents, results of Grade 2 students improve progressively as the level of education of parents increases, from primary to higher education, for both mother and father, in Macedonian and Albanian language of instruction.

Around 39% of the students, whose parents have primary education or less are completing the test in Macedonian language compared with 71% of students whose parents have higher education or more.

Average percentage of Grade 2 students that completed EGRA in Macedonian language according to education of parents

Higher or more — father 71.28%, mother 71.33%
Secondary — father 62.49%, mother 61.83%
Primary or less — father 39.20%, mother 38.75%
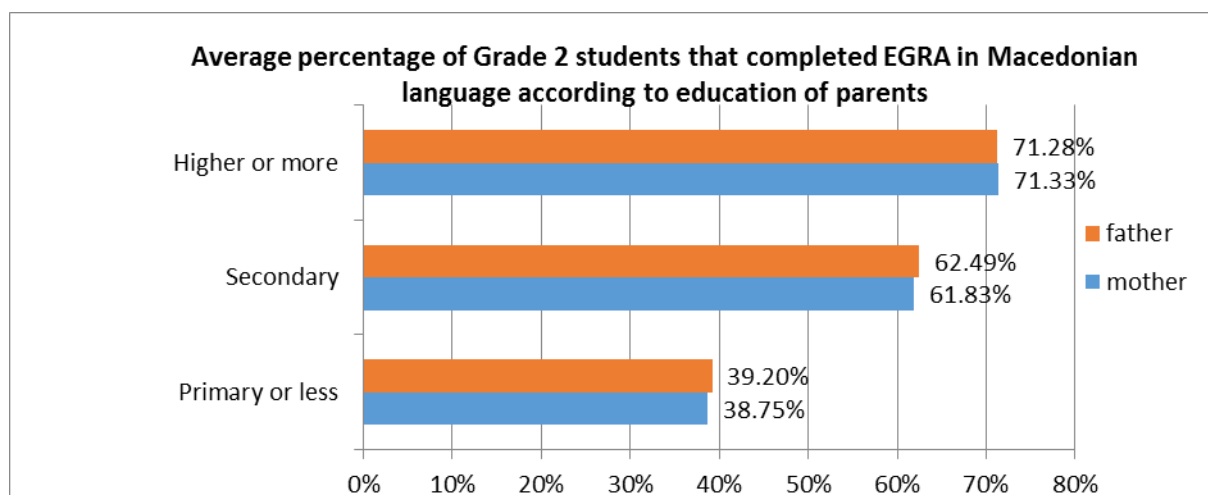
Figure 24. Average percentage of Grade 2 students that completed EGRA in Macedonian language according to education of parents

For the Albanian language of instruction, around 53% of the students, whose parents have primary education or less are completing the test compared with 75% of students whose parents have higher education or more.

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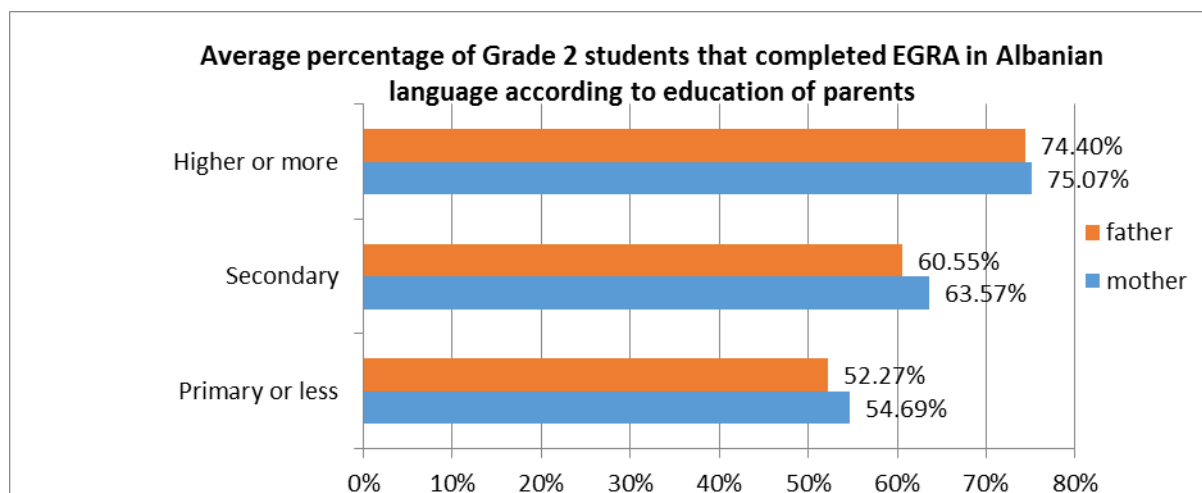
Figure 25. Average percentage of Grade 2 students that completed EGRA in Albanian language according to education of parents

In Grade 3, the education of parents again seems to be predictor of the student results, where students whose parents have lower level of education perform worse than students whose parents have higher level of education.
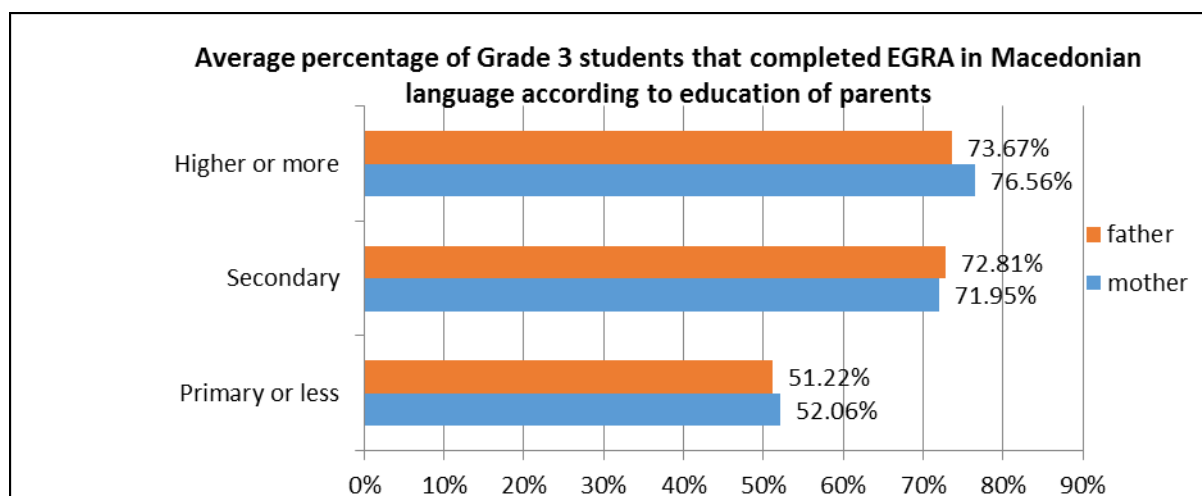
Figure 26. Average percentage of Grade 3 students that completed EGRA in Macedonian language according to education of parents

This trend is evident for students with both Macedonian and Albanian language of instruction in Grade 3. For Macedonian language of instruction, when parents have primary education or less 51% of students complete EGRA compared with 74% of students when their parents have higher education or more. For Albanian language of instruction, 57.5% of students whose parents have primary education complete the test compared with around 80% of students whose parents have higher education.
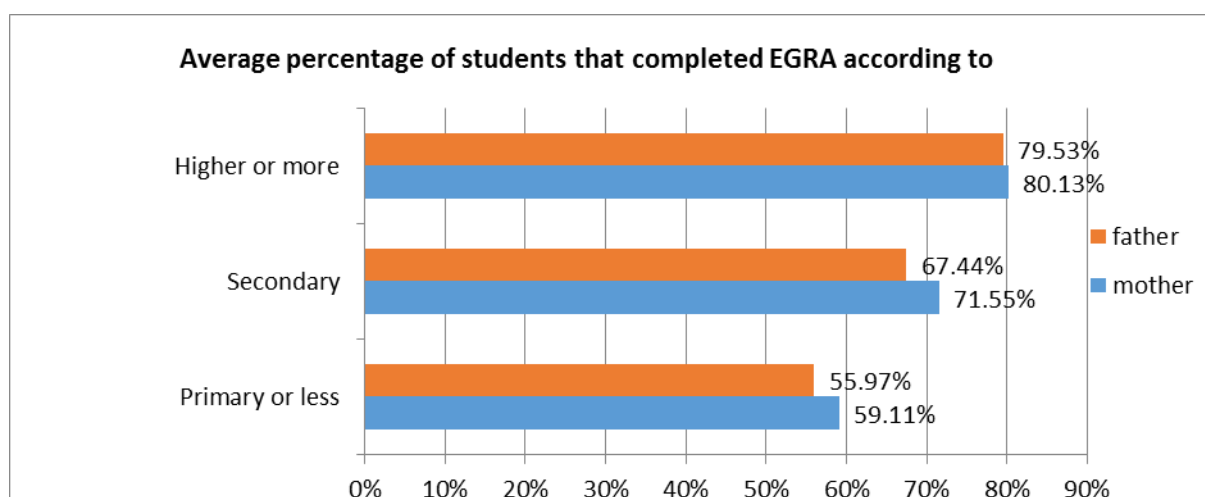
Figure 27. Average percentage of Grade 3 students that completed EGRA in Albanian language according to education of parents

6.2.3 Results according to type of school

The comparison of results of Grade 2 students according to the type of school they attend, showed that students from central schools with Macedonian language of instruction (62%) perform better than students from satellite schools (48%), which are predominantly rural.

For the Albanian language of instruction, the situation is opposite, as students from satellite schools (61%) tend to perform better than students from central schools (56%).
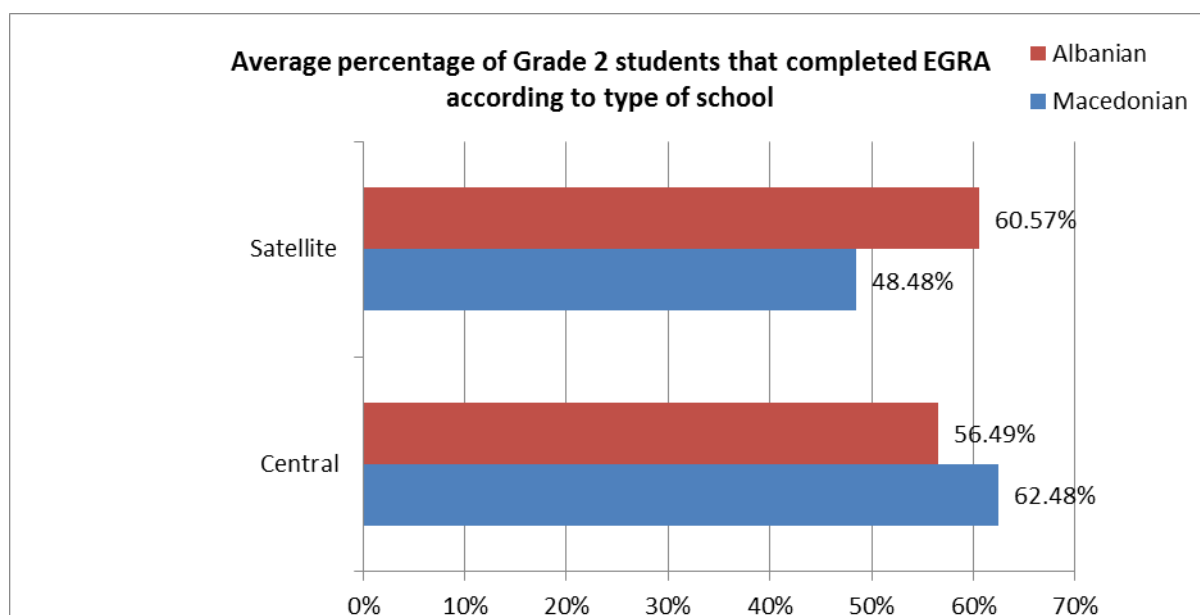
Figure 28. Average percentage of Grade 2 students that completed EGRA according to type of school

In Grade 3, when the language of instruction is in Macedonian, students from central schools have better results (71% vs 64%), while when the language of instruction is in Albanian, students from satellite schools have better results (68% vs 60%).

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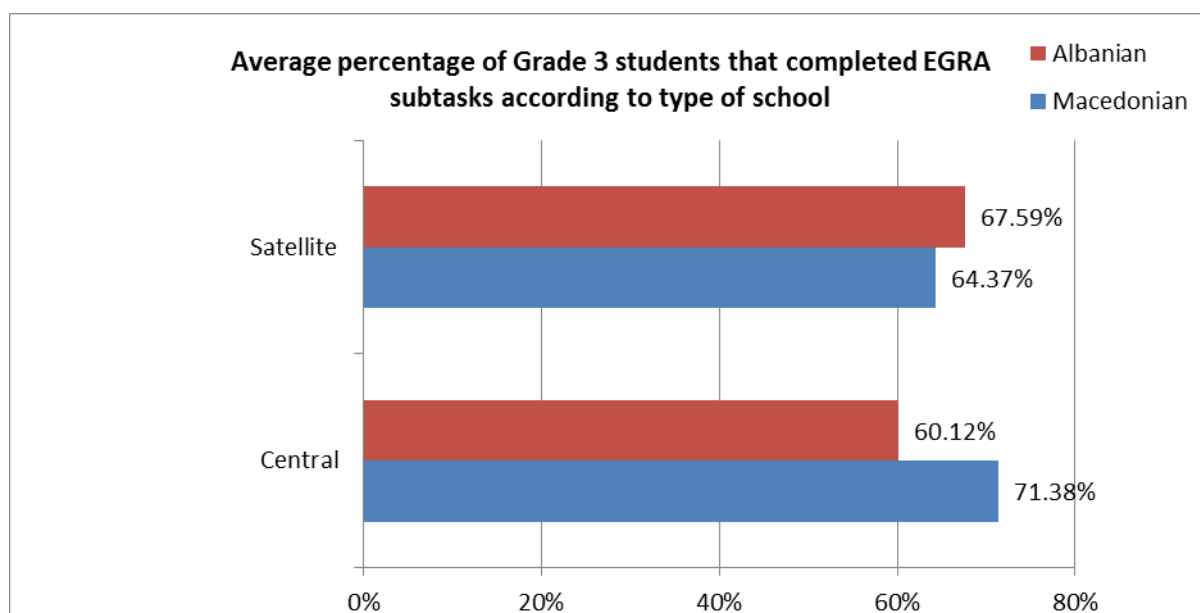
Figure 29. Average percentage of Grade 3 students that completed EGRA according to type of school

6.2.4 Results according to attendance of pre-school

When students were asked as part of the background questions whether they attended pre-school, around two thirds of students with Macedonian language of instruction (69% in Grade 2 and 65% in Grade 3) said they attended such institution.

Table 4. Number of Grade 2 and 3 students attending pre-school

Pre-school attendance	Macedonian				Albanian			
	Grade 2		Grade 3		Grade 2		Grade 3	
	N	%	N	%	N	%	N	%
Yes	505	69,08	470	64,56	41	16,40	31	12,60
No	226	30,92	258	35,44	209	83,60	215	87,40

However, only around 15% of the students with Albanian language of instruction (16.4% in Grade 2 and 12.6% in Grade 3) attended pre-school.
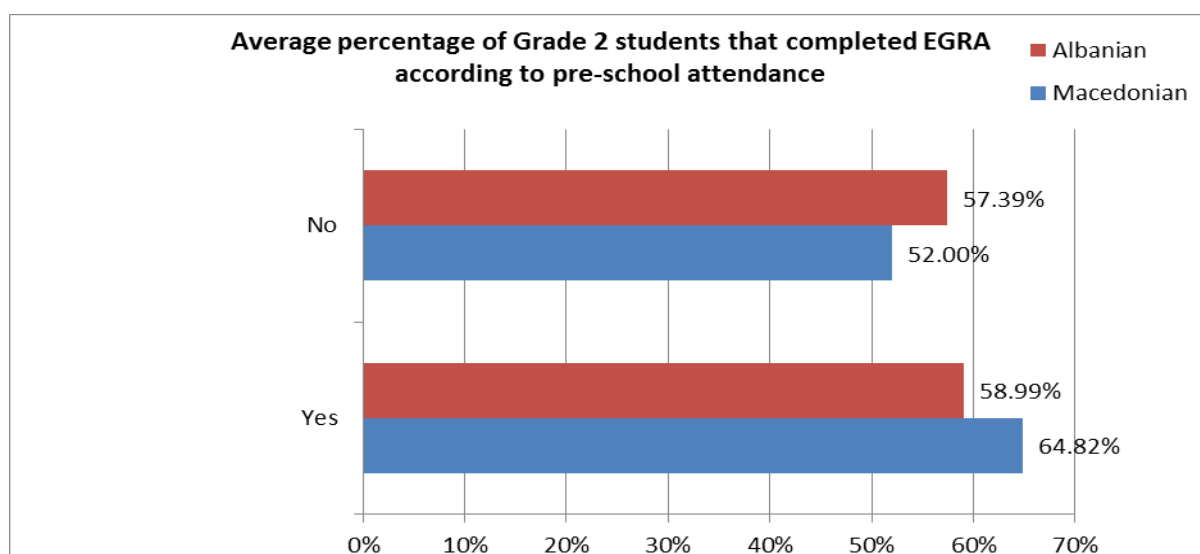
Figure 30. Average percentage of Grade 2 students that completed EGRA according pre-school attendance

Pre-school attendance showed its impact on the results on overall EGRA instrument, as students from both Grade 2 and 3 as well as in both Macedonian and Albanian language of instruction that attended pre-school had better results than students that did not attend pre-school.

For Grade 2 students, the results of those who attended pre-school ranged from 65% for Macedonian language of instruction to 59% for Albanian language of instruction compared with 52% and 57% who did not attend pre-school accordingly.

For Grade 3 students, for Macedonian language of instruction 73% who attended pre-school completed EGRA compared with 66% of those who did not. For Albanian language of instruction 73% of students who attended pre-school completed the test compared with 61% of those who did not attend pre-school.
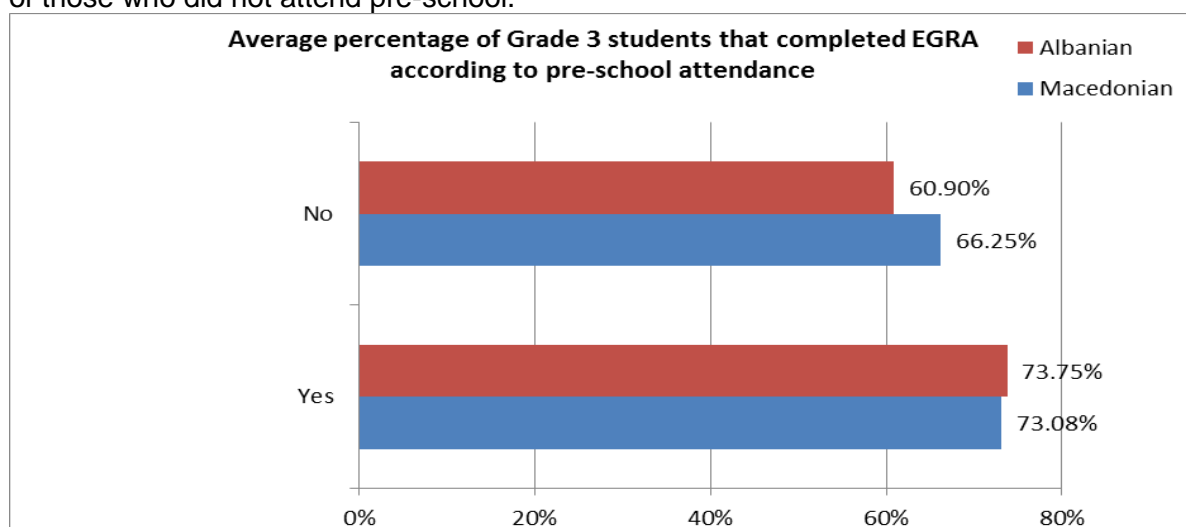
Figure 31. Average percentage of Grade 3 students that completed EGRA according pre-school attendance

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6.2.5 Results according to availability of books at home

Having books at home was another variable that was measured as part of the background questions that may have impact on EGRA results.

Table 5. Number of Grade 2 and 3 students having additional books at home

Book availability	Macedonian				Albanian			
	Grade 2		Grade 3		Grade 2		Grade 3	
	N	%	N	%	N	%	N	%
Yes	559	76,47	605	83,10	122	48,80	118	47,97
No	172	23,53	123	16,90	128	51,20	128	52,03

Around 80% of Macedonian students reported having books at home (76.5 in Grade 2 and 83.1% in Grade 3) compared with around 48% of Albanian students (48.8% in Grade 2 and 47.97 in Grade 3).
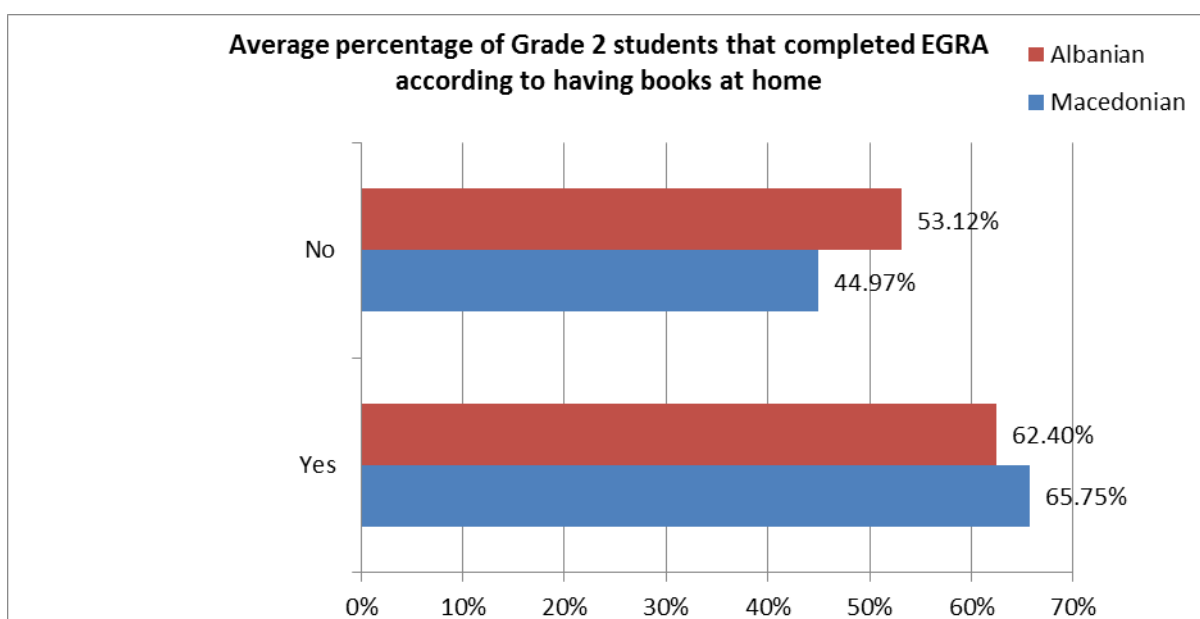
Figure 32. Average percentage of Grade 2 students that completed EGRA according to availability of books at home

The overall EGRA results showed that both Macedonian and Albanian students from Grade 2 and Grade 3 that have books at home performed better than those that did not report having books at home.
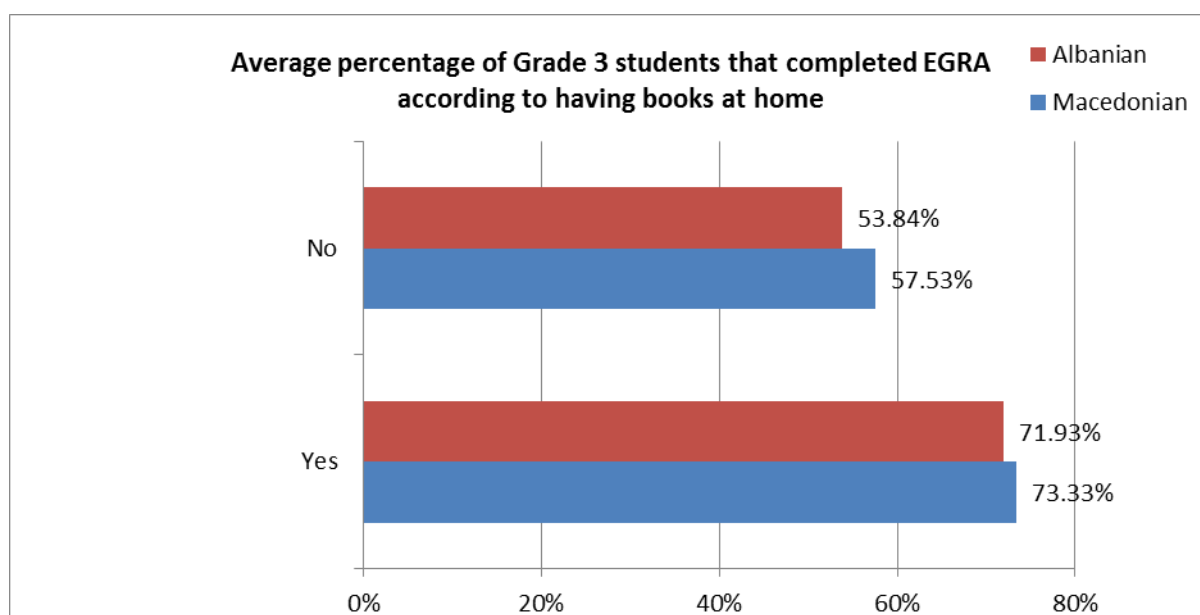
Figure 33. Average percentage of Grade 3 students that completed EGRA according to availability of books at home

6.2.6 Results according to EGRA subtasks

Letter knowledge

For the letter recognition task, students were asked to provide the name of 100 randomized letters of the alphabet in Macedonian and Albanian languages. Research shows that letter *name* recognition is a good predictor of later skills. Letters included were listed in random order to prevent simple recitation of the alphabet and thus test true visual letter recognition and fluency in translating visual input into oral output.

Students are performing equally well in both Macedonian and Albanian languages in both grades. Students with Albanian language of instruction in Grade 2 are better in naming correct letters per minute (83) compared with students with Macedonian language of instruction (74), while in Grade 3 their performance is equal: 85 correct letters per minute for Macedonian and 86 for Albanian students.

Table 6 presents data on attempted and correct letters, the time remaining after completion of the task and the correct letters read per minute.

Table 6. Student results on Letter Identification subtask

	Grade 2		Grade 3	
Language of instruction	**Mac.**	**Alb.**	**Mac.**	**Alb.**
N	**731**	**250**	**728**	**246**
Subtask 1 – Letter knowledge				
Number of items in task	100	100	100	100
Average P-value	73.25%	74.65%	82.48%	82.29%
Time remaining	0.73	2.38	1.31	3.47
Attempted letters (M)	77.94	77.24	84.33	82.30
Correct letters (M)	72.94	74.06	82.09	81.63

Correct letters per minute	74.16	82.91	85.25	86.54

Familiar words reading

For the familiar word recognition task in disconnected text, also timed at one minute, Grade 2 students performed equally well in Macedonian and in Albanian language (30 correct words per minute). However, in Grade 3 students in Macedonian language of instruction were better than students in Albanian language of instruction reading 44 cwpm compared with 40 cwpm.

Table 7. Student results on Familiar Words Reading subtask

	Grade 2		Grade 3	
Language of instruction	**Mac.**	**Alb.**	**Mac.**	**Alb.**
N	**731**	**250**	**728**	**246**
Subtask 2 – Familiar words				
Number of items in task	50	50	50	50
Average P-value	58,45%	54.40%	76.71%	67.34%
Time remaining	1.52	3.16	5.20	5.67
Attempted words (M)	31.43	30.22	39.89	36.82
Correct words (M)	29.10	27.09	38.17	33.54
Correct words per minute	30.56	30.19	44.45	39.63

Reading fluency in connected text

On a similar task but in a connected text (reading fluency task) the students are performing better, as they read around 40 correct words per minute in Grade 2 (41 cwpm in Macedonian and 40 cwpm in Albanian language). This means that students who could read at least one word correctly took, on average, 1.5 seconds to read each word. In Grade 3, Macedonian students have better results reading 73 correct words per minute compared with Albanian students who read 65 cwpm. Automaticity also increases with the grade, reaching 0.8 seconds per word in Macedonian and 0.9 in Albanian.

Table 8. Overall student results on Reading Fluency subtask

	Grade 2		Grade 3	
Language of instruction	**Mac.**	**Alb.**	**Mac.**	**Alb.**
N	**731**	**250**	**728**	**246**
Overall Reading fluency (Subtask 3 & 5)				
Number of items in task	144	153	219	235
Average P-value	54.60%	49.96%	64.63%	54.13%
Time remaining	1.84	2.61	1.13	1.92
Attempted words (M)	40.90	41.07	72.11	66.09
Correct words (M)	39.21	37.82	70.40	63.74
Correct words per minute	41.12	40.09	72.61	65.49
Accuracy (%)	94.02	99.34	97.33	94.86

When the results on this subtask are divided per story, for the Grade 2 students it seems that their fluency is better in the first story (around 42cwpm) compared with the second story (around 38cwpm), which may be result of lower focus and tiredness of students with the progression of the tasks.

For Grade 3 students, the results are equal for both stories (73 cwpm for Macedonian language and 65 cwpm for Albanian language).

Table 9. Student results on Reading Fluency per subtask

	Grade 2		Grade 3	
Language of instruction	**Mac.**	**Alb.**	**Mac.**	**Alb.**
N	**731**	**250**	**728**	**246**
Subtask 3 – Reading fluency (Story 1)				
Number of items in task	66	72	116	112
Average P-value	62.66	53.86	61.84	52.96
Time remaining	2.32	3.24	0.71	1.18
Attempted words (M)	43.07	41.56	73.01	66.59
Correct words (M)	41.24	38.62	71.36	54.35
Correct words per minute	43.86	41.57	72.63	65.47
Accuracy (%)	94.30	91.32	97.17	94.26
Subtask 5 – Reading fluency (Story 2)				
Number of items in task	78	81	103	113
Average P-value	47.79	46.06	67.77	55.40
Time remaining	1.35	1.99	1.55	2.03
Attempted words (M)	38.72	40.57	71.20	65.59
Correct words (M)	37.17	37.01	69.44	63.12
Correct words per minute	38.37	38.61	72.59	65.51
Accuracy (%)	93.74	93.35	97.49	95.47

Reading Comprehension questions

Students on average answered correctly around 7 questions for Macedonian and 6 for Albanian language out of 15 possible for each language in Grade 2 i.e. the level of accuracy is 48% in Macedonian and 42% in Albanian language. The level of comprehension increased in Grade 3, when students answered correctly 12 questions in Macedonian and 10 in Albanian language, out of 19 possible questions and the level of accuracy increased to 65% and 51% accordingly.

Table 10. Overall student results on Reading Comprehension subtask

	Grade 2		Grade 3	
Language of instruction	**Mac.**	**Alb.**	**Mac.**	**Alb.**
N	**731**	**250**	**728**	**246**
Overall Reading Comprehension (Subtask 4 & 6)				
Number of items in task	15	15	19	19
Average P-value	46.36%	36.05%	62.03%	49.55%
Attempted items (M)	14.42	13.21	18.84	18.61
Correct answers (M)	6.95	5.55	12.19	9.57
Accuracy (%)	48%	42%	65%	51%

When the results are presented per story, Grade 2 students have similar results for both stories (around 3 questions correct for both Macedonian and Albanian language of instruction). Grade 3 students seem to be better in answering the questions for the first story (7 in Macedonian language and 5 in Albanian language) than the second one (6 in Macedonian language and 4 in Albanian language).

Table 11. Student results on Reading Comprehension per subtask

	Grade 2		Grade 3	
Language of instruction	Mac.	Alb.	Mac.	Alb.
N	731	250	728	246
Subtask 4 – Reading comprehension questions (Story 1)				
Number of items in task	7	7	11	11
Average P-value	47.76	37.49	58.05	48.19
Attempted items (M)	6.72	6.15	10.96	10.96
Correct answers (M)	3.34	2.72	6.63	5.39
Subtask 6 – Reading comprehension questions (Story 2)				
Number of items in task	8	8	8	8
Average P-value	45.13	34.60	67.50	51.42
Attempted items (M)	7.70	7.11	7.99	7.68
Correct answers (M)	3.61	2.85	5.62	4.20

6.3 How Well Are Pupils Doing Basic Mathematics?

Early Grade Mathematics Assessment (EGMA) used in the baseline study was consisted of eight subtasks: number identification, quantity comparison, missing number (number patterns), addition, subtraction, word problems, shape recognition and pattern extension. For most subtasks, students were asked to complete as many items as they could in one minute. As with EGRA, by timing how quickly pupils perform these tasks, EGMA evaluates whether pupils have achieved a desired level of automaticity in these skill areas.

The average percentage of students that completed the test is based on the average P-value which is obtained by dividing the average test score by the maximum possible test score and multiplying this by 100.

Average percentage of students that completed EGMA subtasks

Subtask	Grade 3	Grade 2
Geometric Pattern Extension	83.31%	84.61%
Geometric Shape Recognition	74.90%	69.21%
Word Problems	57.61%	71.72%
Subtraction	45.62%	65.76%
Addition	59.72%	77.55%
Naming Missing Numbers	61.31%	66.67%
Number Discrimination	96.21%	95.70%
Number identification	98.65%	97.27%
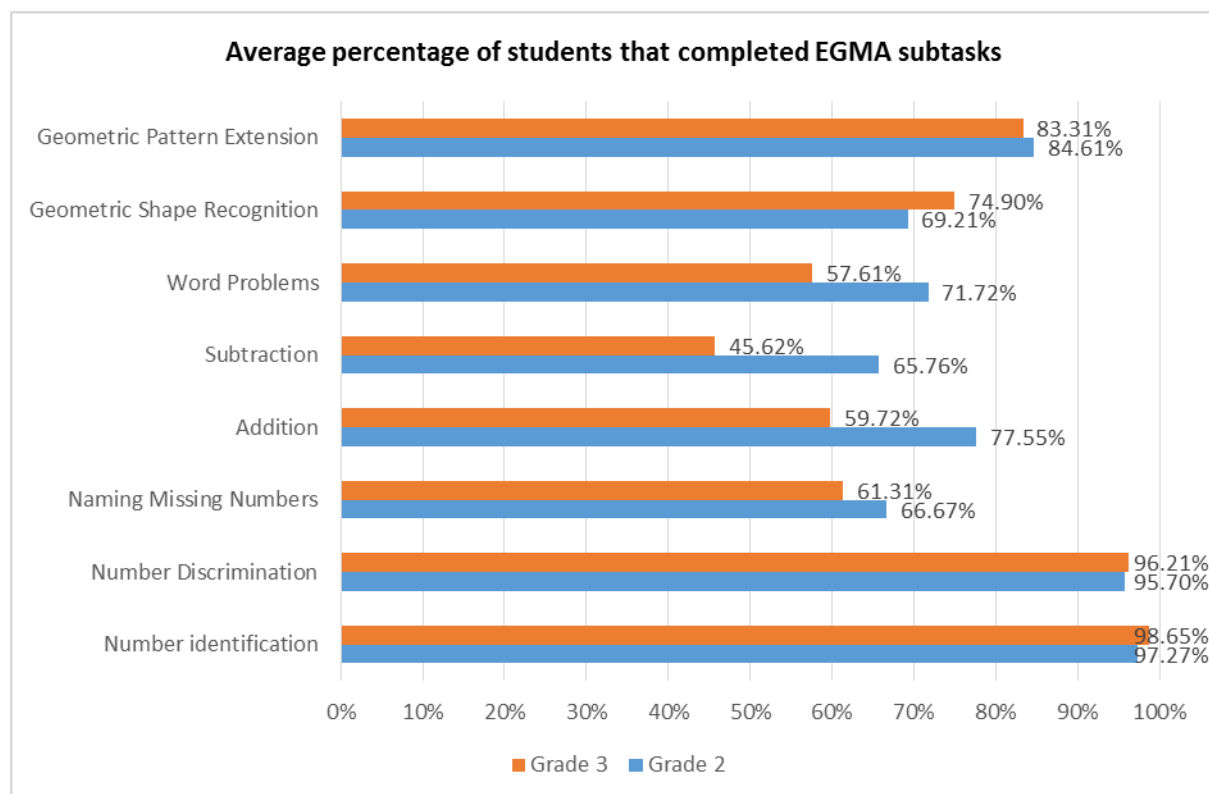
Figure 34. Average percentage of students that completed EGMA subtasks

On the overall EGMA test, Grade 3 students are better on the easier tasks (number identification, quantity discrimination and shape recognition). On all other tasks, Grade 2 students have better overall results. Number identification and number discrimination are the tasks completed by most students (more than 95%), while subtraction seems to be the most difficult task for both Grade 2 (66%) and Grade 3 (46%) students.

6.3.1 Overall test results according to gender

On average, male students are slightly better in math compared with female students in both grades.

Figure 35. Average percentage of students that completed EGMA according to gender
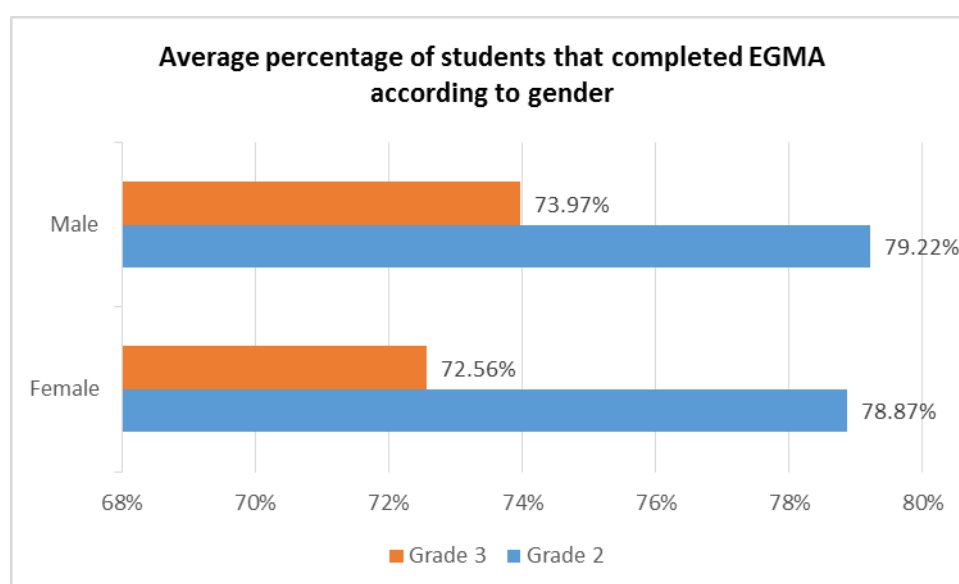
When EGMA instrument was broken down in subtasks, the results for Grade 2 students showed that girls are slightly better than boys in number identification, number discrimination, word problems and geometric pattern extension subtasks.
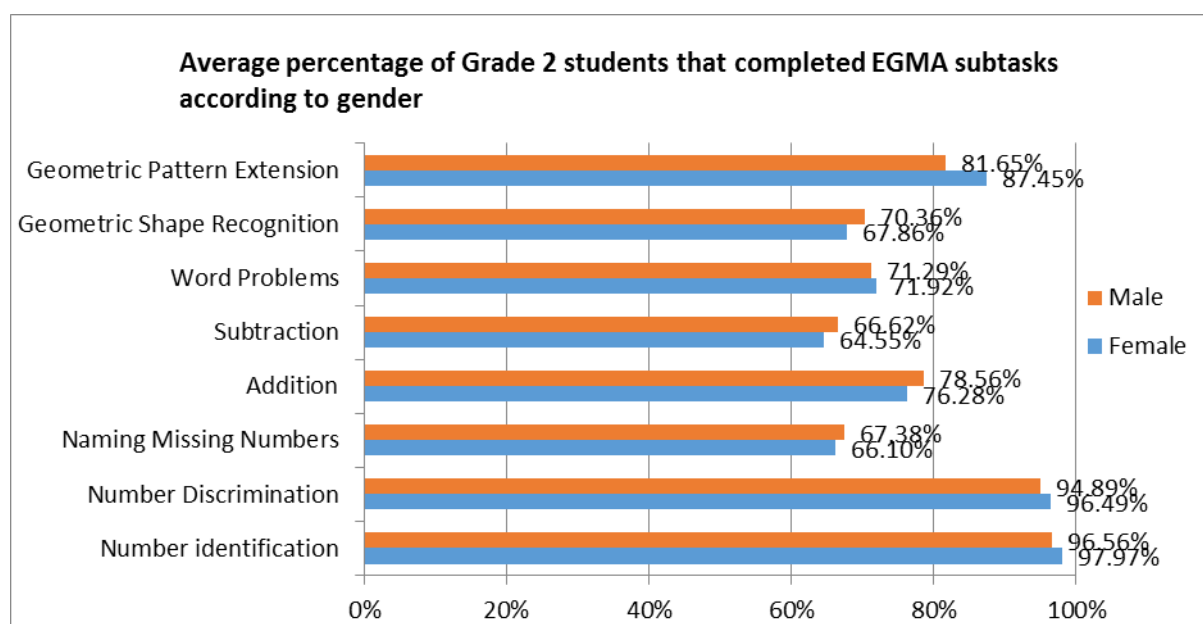
Figure 36. Average percentage of Grade 2 students that completed EGMA subtasks according to gender

In Grade 3, girls are still better than boys in number identification, number discrimination and geometric pattern extension subtasks, but also in geometric shape recognition. On the other hand, boys are better in naming missing numbers, addition, subtraction and word problems.
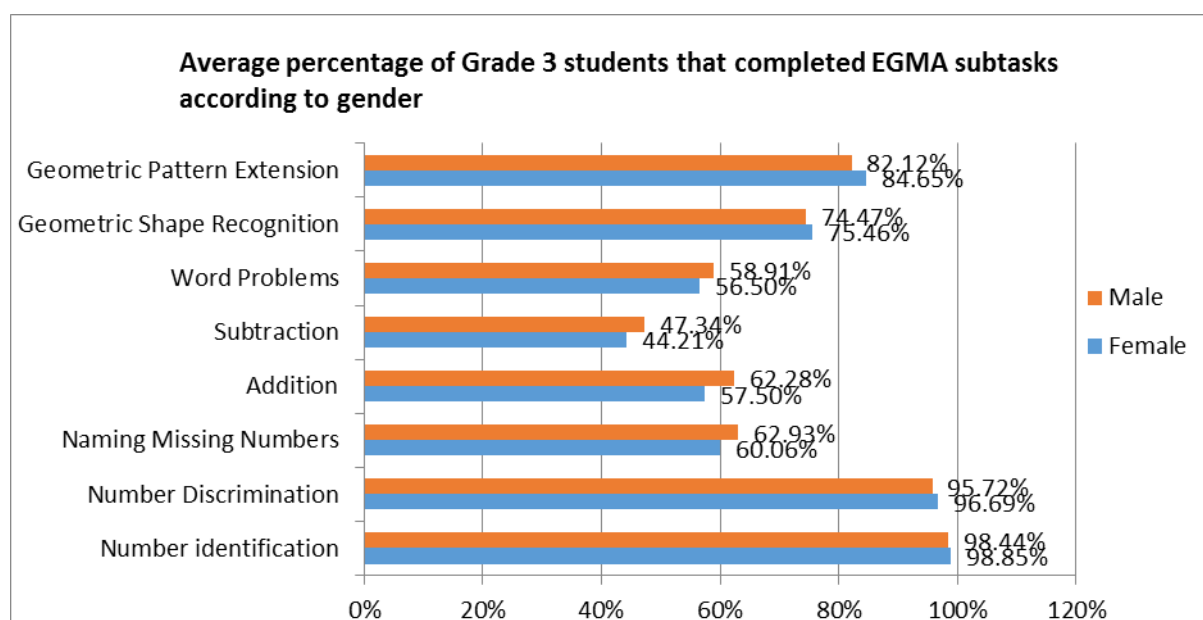
Figure 37. Average percentage of Grade 3 students that completed EGMA subtasks according to gender

6.3.2 Results according to education of parents

Grade 2 students score better as the education of parents increases from primary through secondary to higher education. The average score of students whose parents have

completed primary education is around 70%, increasing to 81% for secondary education and reaching 86% for students whose parents have higher education.
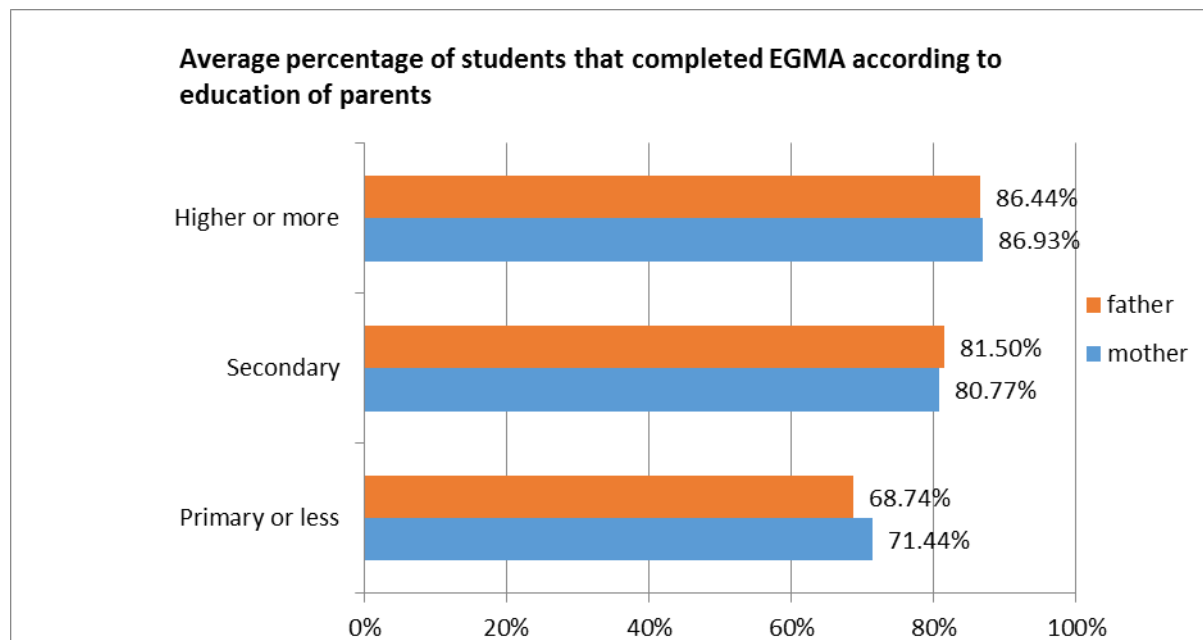
Figure 38. Average percentage of Grade 2 students that completed EGMA according to education of parents

The same trend of better results with the increase in the level of parental education is also evident among Grade 3 students. However, the results of Grade 3 students are lower, starting with 66% for students of parents with primary education or less, through 74% for secondary and up to 77% for higher education and more.
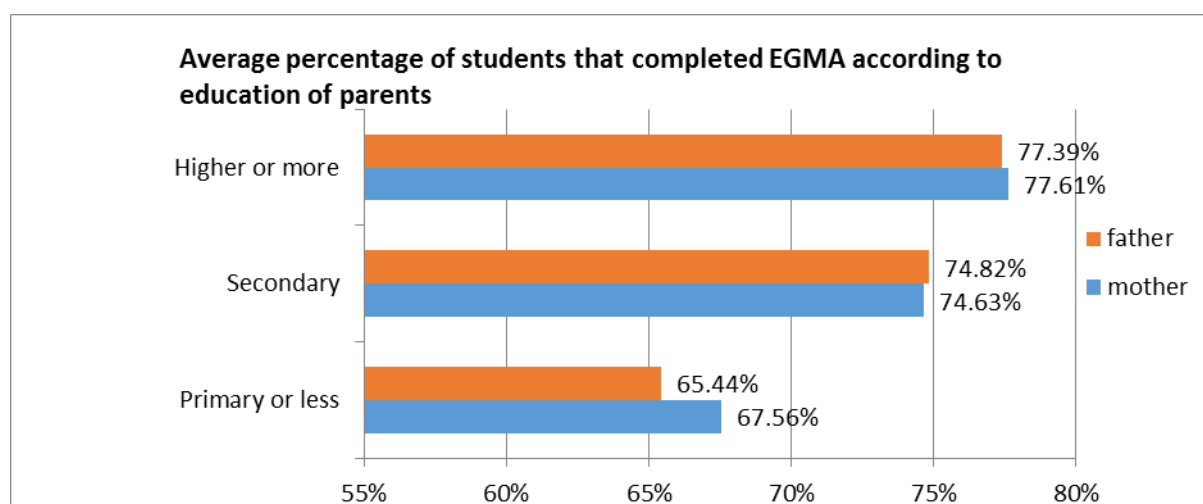
Figure 39. Average percentage of Grade 3 students that completed EGMA according to education of parents

6.3.3 Results according to language of instruction

The language of instruction may be a factor influencing the results in mathematics. Both Grade 2 and Grade 3 students with Macedonian language of instruction show better results in all EGMA subtasks, except for the geometric shape recognition, where Albanian students are better (the average percentage is 75% in Albanian, 67% in Macedonian in Grade 2; 79% in Albanian, 74% in Macedonian in Grade 3).
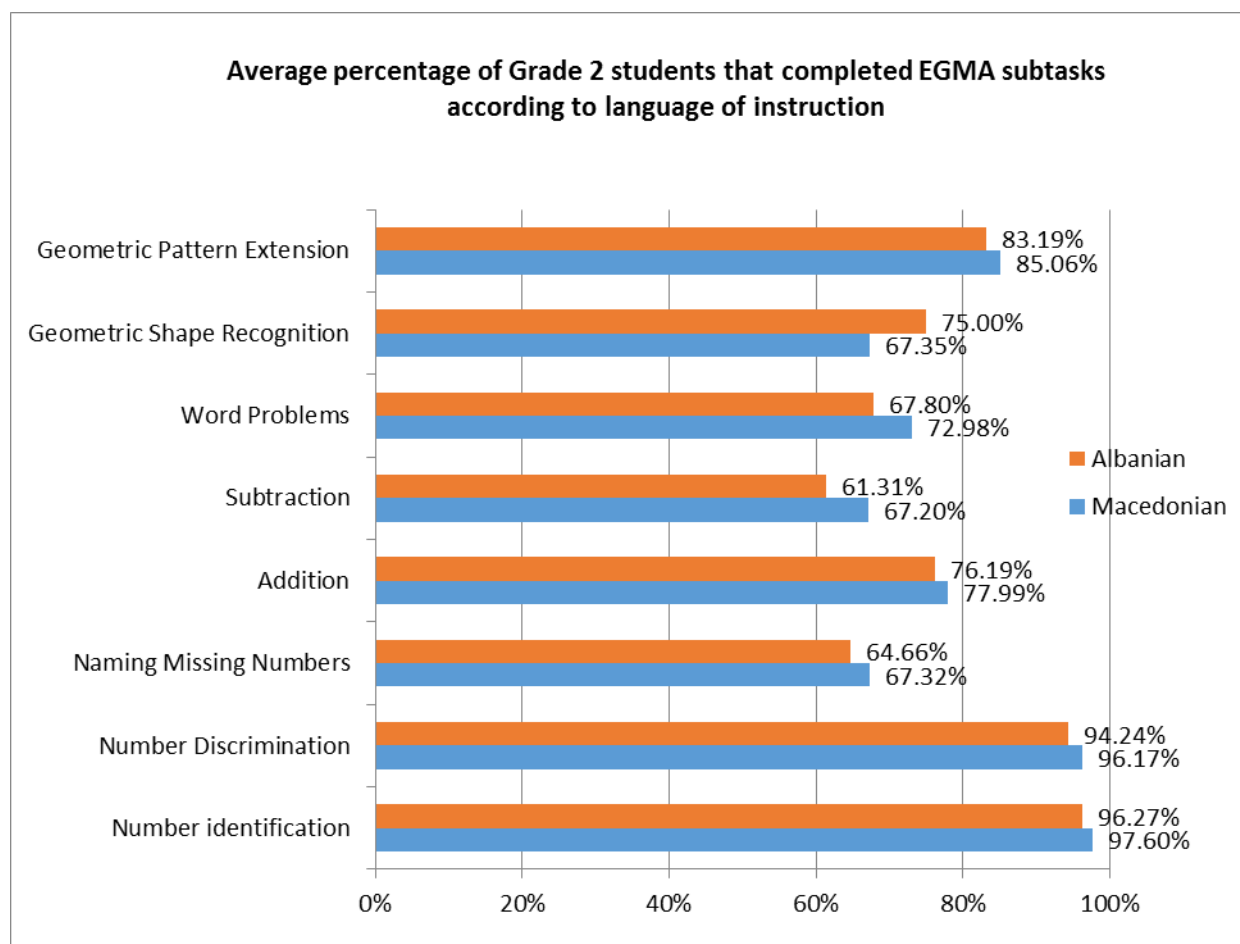
Figure 40. Average percentage of Grade 2 students that completed EGMA subtasks according to language of instruction

In Grade 2, students in both languages of instruction show best results in number identification (98% in Macedonian, 96% in Albanian language), number discrimination (96% in Macedonian and 94% in Albanian) and geometric pattern extension (85% in Macedonian and 83% in Albanian). Again the worst results are scored in subtraction (67% in Macedonian, 61% in Albanian), naming missing numbers (67% in Macedonian, 65% in Albanian) and word problems (73% in Macedonian, 68% in Albanian).

Average percentage of Grade 3 students that completed EGMA subtasks according to language of instruction

Subtask	Albanian	Macedonian
Geometric Pattern Extension	81.35%	83.96%
Geometric Shape Recognition	78.59%	73.66%
Word Problems	55.43%	58.34%
Subtraction	44.67%	45.93%
Addition	57.75%	60.38%
Naming Missing Numbers	60.41%	61.61%
Number Discrimination	94.32%	96.84%
Number identification	97.40%	99.07%

Figure 41. Average percentage of Grade 3 students that completed EGMA subtasks according to language of instruction

The results of Grade 3 students compared with Grade 2 students in both languages of instruction are better in number identification (99% in Macedonian, 97% in Albanian language) and number discrimination (97% in Macedonian and 94% in Albanian). However, the results in other subtasks are worse, such as subtraction (46% in Macedonian, 45% in Albanian), naming missing numbers (61% in Macedonian, 60% in Albanian) and word problems (58% in Macedonian, 55% in Albanian).

6.3.4 Results according to type of school

In Grade 2, students from central schools show slightly better average results than students in satellite schools (79% vs. 78% accordingly), but it is vice versa for Grade 3 students where those from satellite schools (75%) perform better than those from central schools (72%).
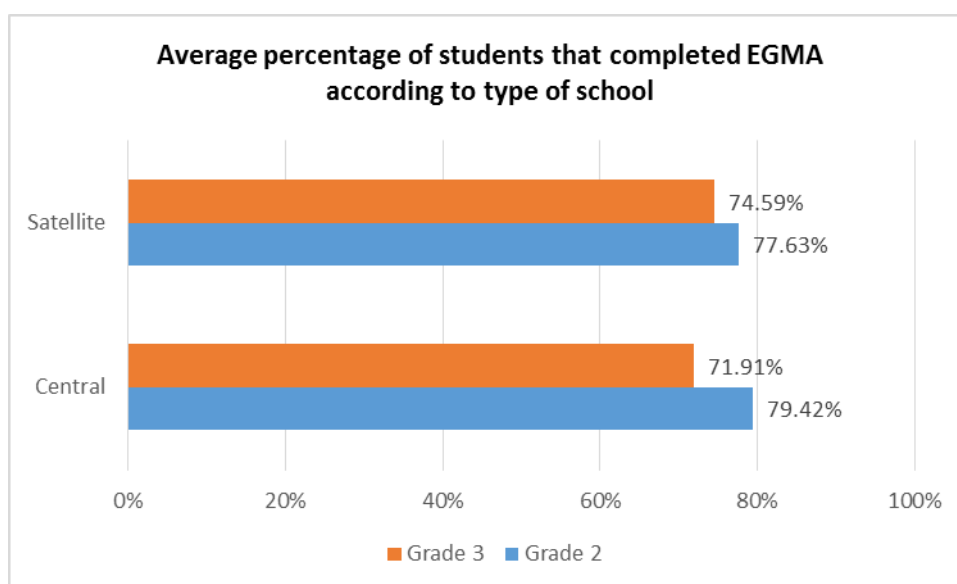
Figure 42. Average percentage of students that completed EGMA according to type of school

6.3.5 Results according to attendance of pre-school

From the overall EGMA sample of Grade 2 students (N=928), around 55% reported attending pre-school. The number of Grade 3 students that attended pre-school is slightly lower (52% of 950 students).

Table 12. Number of Grade 2 and 3 students attending pre-school

Pre-school attendance	Grade 2		Grade 3	
	N	%	N	%
Yes	510	54,96%	493	51,89%
No	418	45,04%	457	48,11%

Students that attended pre-school tend to have better average results in EGMA both in Grade 2 (82% vs. 76%) and Grade 3 (75% vs. 71%).
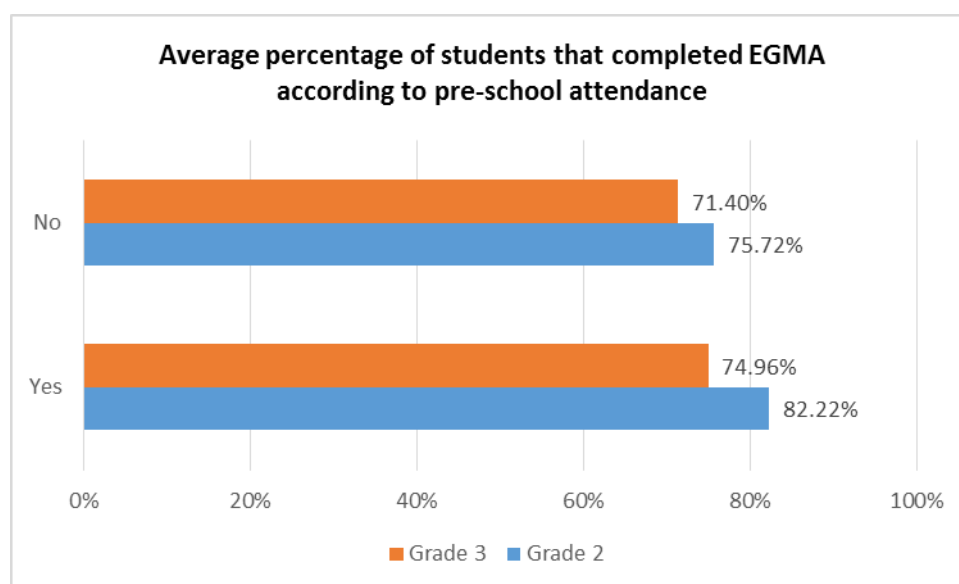
Figure 43. Average percentage of students that completed EGMA according to pre-school attendance

6.3.6 Results according to availability of books at home

Around 70% of Grade 2 and 74% of Grade 3 students reported having additional books at home.

Table 13. Number of Grade 2 and 3 students having additional books at home

Book availability	Grade 2		Grade 3	
	N	%	N	%
Yes	649	69,94%	703	74,00%
No	279	30,06%	247	26,00%

Similarly as with the reading test, availability of books at home also affects results in mathematics, because students that reported having books at home have better results in both assessed grades.

The overall EGMA score for Grade 2 students that have additional books at home is 83% compared with 71% of students not having books. The average score for Grade 3 students is 76% for student having books at home and 66% for students not having books at home.
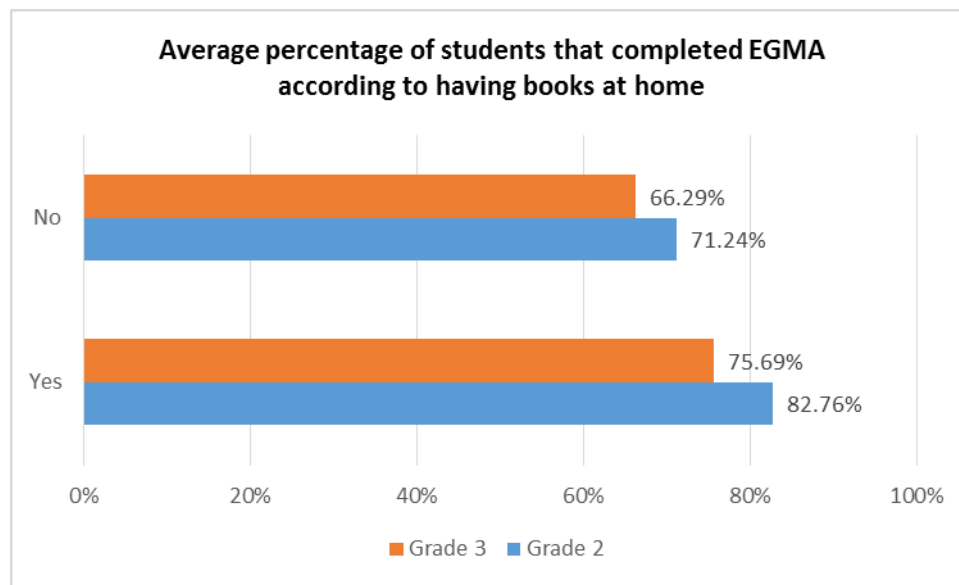
Figure 44. Average percentage of students that completed EGMA according to availability of books at home

6.3.7 Results according to EGMA subtasks

Number identification

The number identification subtask targeted student knowledge and identification of one- and two-digit numbers. High average P-value of more than 97% in Grade 2 and 98% in Grade 3 shows that this subtask is an easy one. Based on the time remaining for this task and the number of correct numbers recognized, the pace of identifying correct numbers per minute is set at 66 for Grade 2 students and 55 for Grade 3 students. The accuracy is also high.

Table 14. Overall student results on Number Identification subtask

	Grade 2	Grade 3
N	**968**	**972**
Subtask 1 – Number identification		
Number of items in task	10	15
Average P-value	97.27	98.65
Time remaining	49.30	41.92
Attempted numbers (M)	9.94	14.94
Correct numbers (M)	9.73	14.77
Correct numbers per minute	65.71	54.94
Accuracy (%)	97.89	98.86

Number discrimination

For the number discrimination task, students were shown two numbers at a time and asked to identify the larger number (e.g., —Which one is bigger). This task measures children's ability to make judgments about differences by comparing numbers. Identifying the bigger number is an important precursor to addition and subtraction. The stop rule for this task was to stop the task upon 4 consecutive errors. This task has two practice items that provide the students with feedback before they began the task that would be scored.

This seemed to be an easy task for the students, as on average 96% of both Grade 2 and Grade 3 students have completed it and the level of accuracy is beyond 96%.

Table 15. Overall student results on Number Discrimination subtask

	Grade 2	Grade 3
N	968	972
Subtask 2 – Number discrimination		
Number of items in task	5	7
Average P-value	95.70	96.21
Attempted items (M)	4.98	6.96
Correct items (M)	4.79	6.73
Accuracy (%)	96.18	96.70

Missing numbers

For the missing number task, each item in this subtask consisted of four placeholders with numbers in a sequence and one placeholder blank for a next or missing number (e.g., 5; 6; 7; ___). The student was asked to determine and name the missing number. This task is used to evaluate children's familiarity with number sequences. This task had two practice items administered to students, with feedback.

On average, Grade 2 students have 3 correct items out of 5, while Grade 3 students 6 out of 10. Lower average P-value and lower level of accuracy on this subtask in comparison with the previous two shows that students find it more difficult.

Table 16. Overall student results on Missing Numbers subtask

	Grade 2	Grade 3
N	968	972
Subtask 3 – Missing numbers		
Number of items in task	5	10
Average P-value	66.67	61.31
Time remaining		26.28
Attempted items (M)	4.98	9.24
Correct items (M)	3.34	6.14
Accuracy (%)	67	66

Addition

The addition subtask assesses student procedural competency in basic operations. The addition problems explored different levels of difficulty to learn whether students understood simple addition (e.g., 4 + 5 = ?), the adding of multidigit items (e.g., 13 + 12 = ?), and an understanding of carryover (e.g., 11 + 9 = ?). The items did not progress in difficulty; instead, they were randomly mixed. The students were instructed to respond orally, but items were supplemented with assessor observations of student strategy use (e.g., counting fingers, using counters or pencil and paper).

This subtask has lower average p-value (77.6% in Grade 2 and 59.72% in Grade 3). However, the level of accuracy is still high of around 90% for both grades, which means that the students that attempt the item usually get it right. As the difficulty of items in the subtask increases in Grade 3, it takes more time for these students to solve the addition problems.

Around 80% of students in both grades used mental calculations for doing the additions. Fingers (55%) and manipulatives or counters (17%) are predominantly used by Grade 2 students, while Grade 3 students prefer to use pencil and paper (35%).

Table 17. Overall student results on Addition subtask

	Grade 2	Grade 3
N	968	972
Subtask 4 – Addition		
Number of items in task	10	10
Average P-value	77.55	59.72
Time remaining	9.26	1.89
Attempted items (M)	8.58	6.75
Correct items (M)	7.79	5.99
Correct per minute	10.67	6.30
Accuracy (%)	90.79	88.74
Use of fingers	55.37%	23.97%
Use of manipulatives	17.36%	6.30%
Use of pencil and paper	4.96%	34.71%
Mental calculation	79.13%	81.61%

Subtraction

The subtraction subtask also assessed student procedural competency, exploring different levels of difficulty. This included simple subtraction (e.g., 9 – 5 = ?) as well as more difficult, advanced problems (e.g., borrowing). The items were again supplemented with assessor observations of student strategy use (e.g., counting fingers, using counters).

On the subtraction subtask, the students show worse results compared with addition.

The average p-value is lower for both grades, 66% of Grade 2 students and 46% of Grade 3 students.

Results of Grade 3 students demonstrate that a smaller number of items are being attempted by the students, either because items were too difficult or students did not get to these items within the 60-second timing of this task.

Again the use of counters, especially in Grade 3, is low as in resolving the subtraction problems. Most students opt for doing the calculations mentally.

Table 18. Overall student results on Subtraction subtask

	Grade 2	Grade 3
N	968	972
Subtask 5 – Subtraction		
Number of items in task	10	10
Average P-value	65.76	45.62
Time remaining	5.31	1.40
Attempted items (M)	7.98	5.90
Correct items (M)	6.61	4.56
Correct per minute	7.90	4.72
Accuracy (%)	82.83	77.28

Use of fingers	59.19%	25.21%
Use of manipulatives	19.83%	6.61%
Use of pencil and paper	5.37%	37.09%
Mental calculation	81.92%	81.40%

Word Problems

Student informal concepts of addition and subtraction (Grade 2) and of addition, subtraction, multiplication and division (Grade 3) are assessed through contextual problems, assessing children strategies and flexibility in solving problems. This task began with a practice item that provided feedback.

From all subtasks in EGMA instrument, students have lowest level of accuracy in word problems, which is lower for Grade 2 students (44%) and higher for Grade 3 students (58%).

When it comes to using different strategies for solving the word problems, Grade 2 children tend to use their fingers, while Grade 3 students use pencil and paper for this subtask. Majority of children are still trying to do the calculations mentally without using any other means.

Table 19. Overall student results on Word Problems subtask

	Grade 2	Grade 3
N	**968**	**972**
Subtask 6 – Word Problems		
Number of items in task	4	4
Average P-value	71.72	57.61
Attempted items (M)	3.99	3.97
Correct items (M)	1.77	2.30
Accuracy (%)	44	58
Use of fingers	55.99%	21.38%
Use of manipulatives	19.63%	7.44%
Use of pencil and paper	20.97%	74.28%
Mental calculation	78.62%	71.49%

Geometric Shapes Recognition

This subtask assesses student ability to identify and point out specific shapes from a variety of given shapes. For the shape recognition task, the assessor gave the students stimuli sheet and then asked them to point out a specific shape (e.g., circles, squares) that s/he would find on a specific shape sheet.

As the items in this task were the same both for Grade 2 and Grade 3 students, the comparisons between the two grades are more meaningful. The average p-value, the number of correct items and the level of accuracy increases with the grade, as Grade 3 students have better results.

Table 20. Overall student results on Geometric Shapes Recognition subtask

	Grade 2	Grade 3
N	**968**	**972**
Subtask 7 – Geometric Shapes Recognition		
Number of items in task	4	4

Average P-value	69.21	74.90
Attempted items (M)	3,98	3,99
Correct items (M)	2,79	3.00
Accuracy (%)	70	75

Geometric Patterns Extension

For the pattern extension task, students were shown a series of shapes and told to select one of the items below the series to finish the pattern. The goal was to evaluate children's ability to recognize and complete an incomplete repetitive pattern by filling in the missing shape(s). Pattern recognition represents the beginnings of algebraic thinking.

The students from both grades show similar results on this subtask, with similar average p-values (85% for Grade 2 and 83% for Grade 3). The number of correct items is higher in Grade 3 (3.35 vs. 2.56 accordingly).

Table 21. Overall student results on Geometric Patterns Extension subtask

	Grade 2	Grade 3
N	**968**	**972**
Subtask 8 – Geometric Patterns Extension		
Number of items in task	3	4
Average P-value	84.61	83.31
Attempted items (M)	2,99	3.99
Correct items (M)	2,56	3.35
Accuracy (%)	85.6	84

7. BASELINE QUESTIONNAIRES

7.1 Description of the instruments

The main instruments for data collection for the baseline study were questionnaires and protocols for direct classroom observation.

The questionnaires were based on the Snapshot for School Management Effectiveness, or SSME, an instrument developed by RTI that has been applied in conjunction with Early Grade Reading Assessments (EGRA) and/or Early Grade Mathematics Assessments (EGMA). As SSME gives a holistic snapshot of schools—from the administration and infrastructure to the teachers and students, parts of the instrument were modified to the local context to be used as a tool for the training needs assessment and the baseline study.

The original questionnaires were first translated into Macedonian language and were then shared with the members of the EGRA and EGMA Work Groups. Their comments and suggestions were taken into consideration, especially regarding removing some questions that were obsolete for Macedonia's context, rephrasing of the existing ones and developing new questions that could be applied for primary schools in Macedonia.

After the questionnaire were finalized by the project team, they were translated into Albanian language.

Three questionnaires were developed for the purpose of this baseline research:

1. School Director/ Assistant School Director Questionnaire – administered to the school director or the assistant school director;
2. Teacher Questionnaire – administered to the early grade teachers from first to fifth grade;
3. Parent Questionnaire – administered to parents participating in earlier project activities within Component 5: Involvement of Family and Local Community.

The aim of the questionnaires was to gather data about the perceptions and expectations of different stakeholders (school management, teachers, and parents) about the reading and mathematics in early grade education.

In the preparation of the questionnaires, special attention was paid some questions to overlap, in order to ensure comparability between the answers of the school directors, teachers and the parents as much as possible.

In addition a special protocol was developed as a classroom inventory observation list, with relevant questions about the available learning materials and equipment in the early grade classrooms.

The protocol also included questions about the perception of teachers regarding their immediate training needs in the area of early grade literacy and numeracy.

7.2 Data gathering procedure

In addition to EGRA and EGMA student assessments, data for the baseline study were collected via direct classroom and school observation; questionnaires and interviews with teachers, principals, and parents.

The above mentioned questionnaires were developed as online questionnaires, available on Google docs, while the questionnaires for parents were also available as hard copy in order to reach out to parents who do not have access to the internet or are not computer literate. These hard copy questionnaires were distributed to 41 pilot and phase 2 schools and the parents received them through the school psychologists and pedagogues. After the schools returned the questionnaires, the responses were coded and inserted into Excel file and then summed with the responses from the online questionnaires.

For administration of online questionnaires, a letter, including a brief explanation of the purpose of questionnaires and links to the Macedonian and Albanian version of each questionnaire leading to the Google docs page for online filling of the questionnaire was sent to school directors, teachers and parents. Their contacts and e-mail addresses were available from the project database, encompassing contact details of all participants in school and community events implemented within Reading and Math are Fun activities. The questionnaires were open for electronic filling out in the period from May 19 to June 4, 2014.

The answers provided by the respondents were automatically entered in a special database, which has enabled a simple access to the answers so that they could be further processed.

The classroom/school observation was conducted through field visits to the school, by the project team and five educational coordinators of Step by Step. Several classrooms were visited in each school, but the observation protocol was filled out only for the most

representative classroom, considered by the teachers as most comfortable learning environment. The results were then recorded in an Excel sheet in order to provide relevant comparisons among the schools.

The teachers' training needs were assessed through interviews with teachers during the field visits as well as during the EGRA and EGMA training.

7.3 Description of the sample

The respondents of questionnaires included:

- 33 school directors;
- 171 early grade teachers;
- 151 parents.

Of the 33 school directors that filled out the questionnaire 88% were Macedonians and 12% Albanians, while according to the gender structure, 55% were male and 45% female.

Figure 45: Ethnic and gender structure of surveyed school directors

The surveyed 171 early grade teachers, included 149 female (87%) and 22 male (13%) teachers. According to the ethnic structure, 75.4% were Macedonians, 20.5% Albanians and 4.1% Turks.
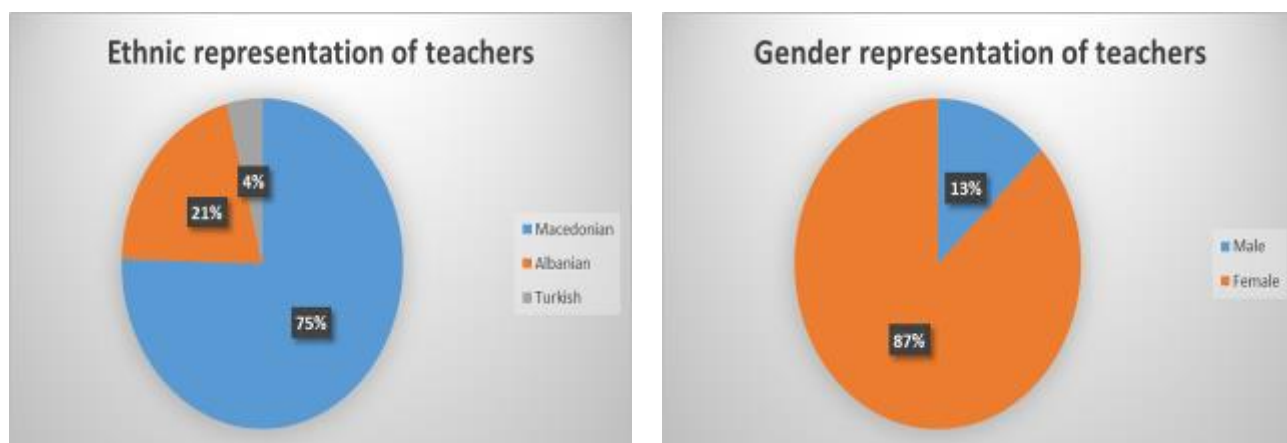
Figure 46: Ethnic and gender structure of surveyed early grade teachers

The level of education of early grade teachers showed that three quarters (74%) had university degree. Only 7% had master or doctoral degree, while 19% still have post-secondary education (two-years of teacher training).
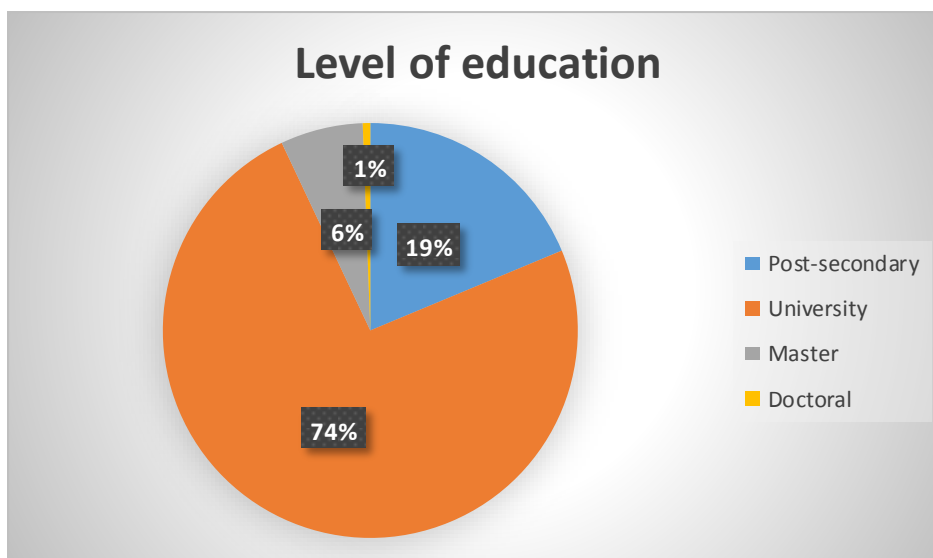
Figure 47: Level of education of surveyed early grade teachers

The sample for the field visits included 27 of 42 schools, participating in the pilot and phase 2 of project activities. They were chosen to represent different types of schools by relevant criteria (language of instruction, ethnic structure, location and regional distribution), in order to secure participation of all types of schools, which will enable relevant comparisons.

Based on the school location, the sample included 70% urban schools and 30% rural schools.

The analysis showed that three quarters of the schools (76%) provide split-shift schooling, i.e. students attend classes in the mornings or afternoons.
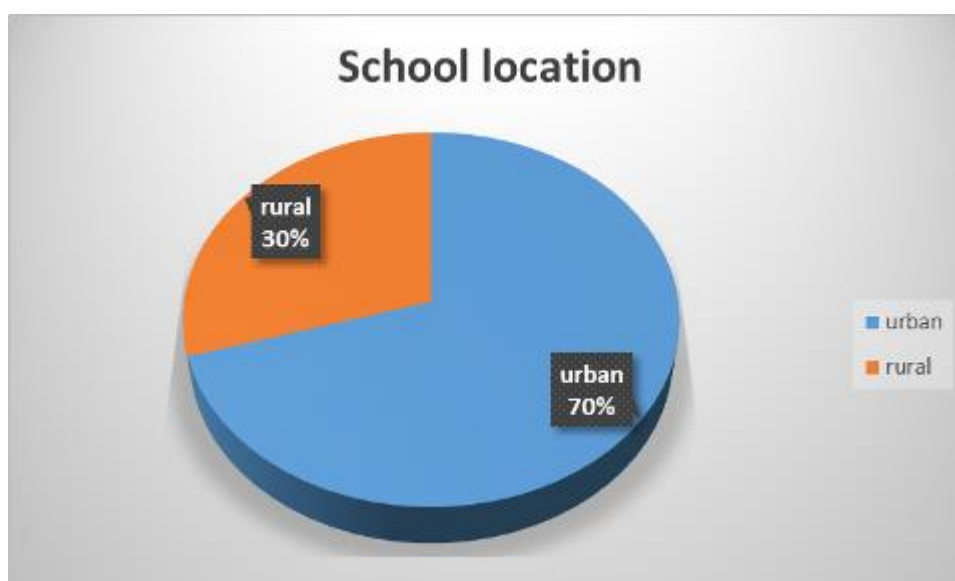
Figure 48: Representation of schools in the sample according to the location

According to the language of instruction, 70% of the visited schools provided instruction only in Macedonian language, 15% only in Albanian language, while 15% in both Macedonian and Albanian language.
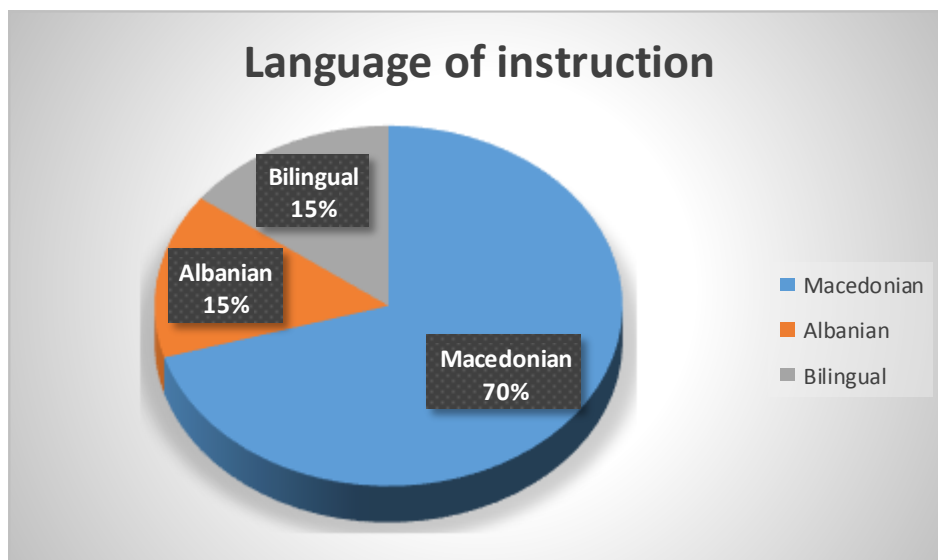
Figure 49: Representation of schools in the sample according to the language of instruction

Depending on the size, the number of early grade teachers varied in the schools. Most of the schools (46%) have more than 20 early grade teachers, while 39% between 11 and 20 teachers. Total of 15% of the schools in the sample have up to 10 early grade teachers.
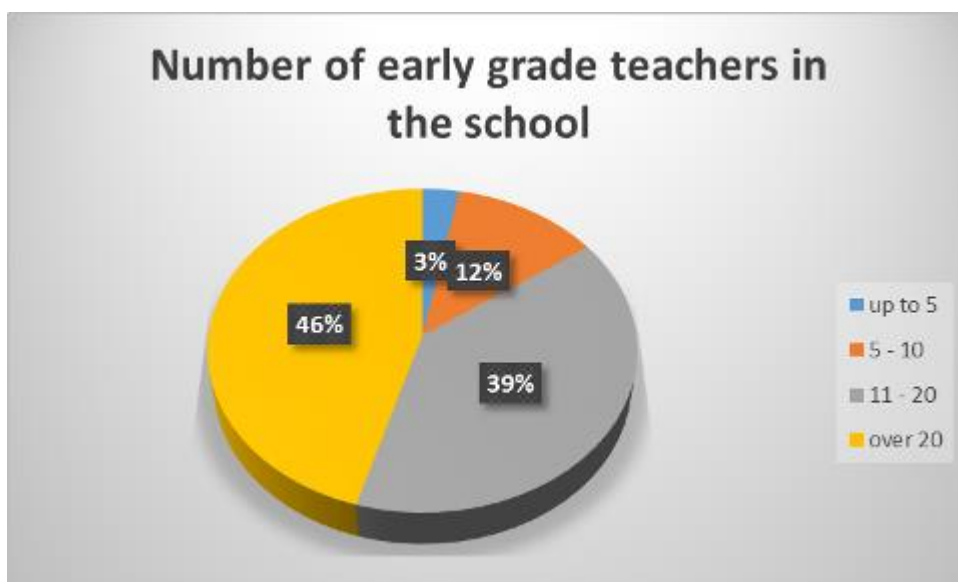
Figure 50: Number of early grade teachers in sample schools

Regarding the surveyed parents, the sample included 56% fathers and 44% mothers.
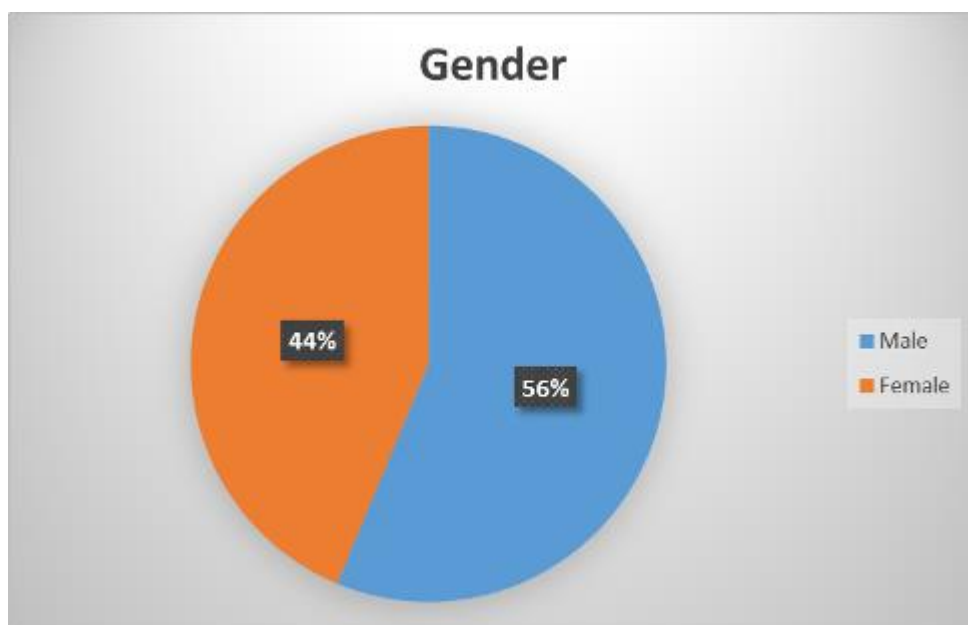
Figure 51: Gender structure of surveyed parents

Based on the level of education, most of them (43%) have completed secondary education, 20% have primary education, while 37% have university education and higher.
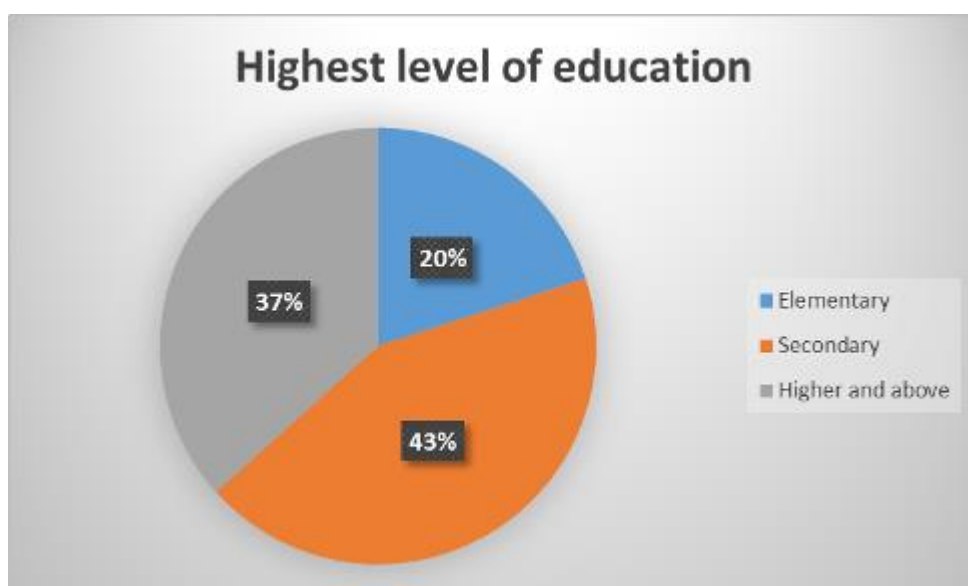
Figure 52: Highest level of education completed by surveyed parents

Based on the ethnic representation, 75% of the parents are Macedonians, 22% Albanians, 1.3% Turks and 0.7% Serbs.
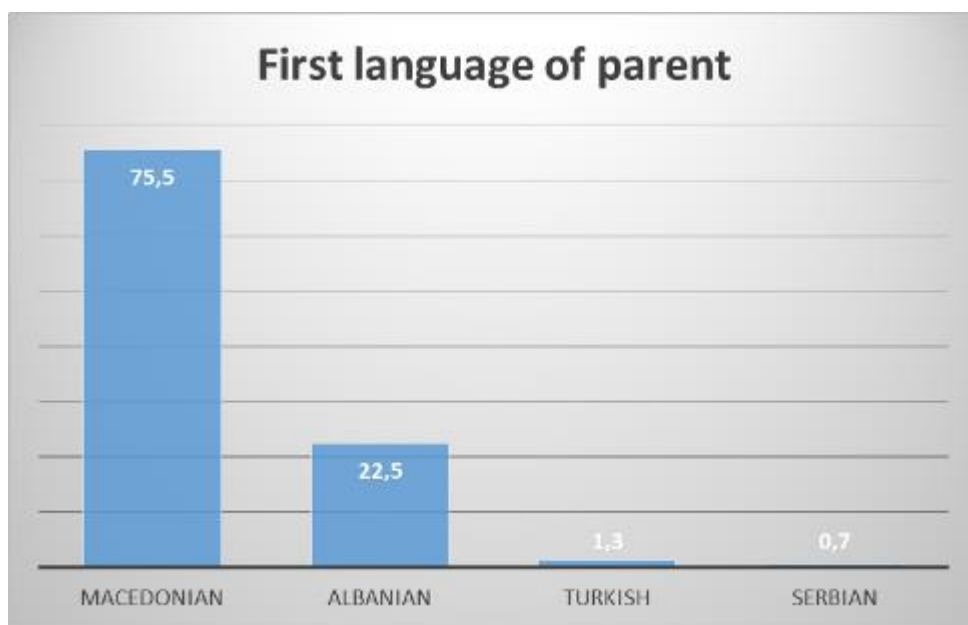
Figure 53: Native language of surveyed parents

When the parents were asked in what language their children attended classes, 79.5% said they attended classes in Macedonian, while 20.5% in Albanian, suggesting that children whose native language is Turkish and Serbian and some with Albanian first language attend classes in Macedonian.
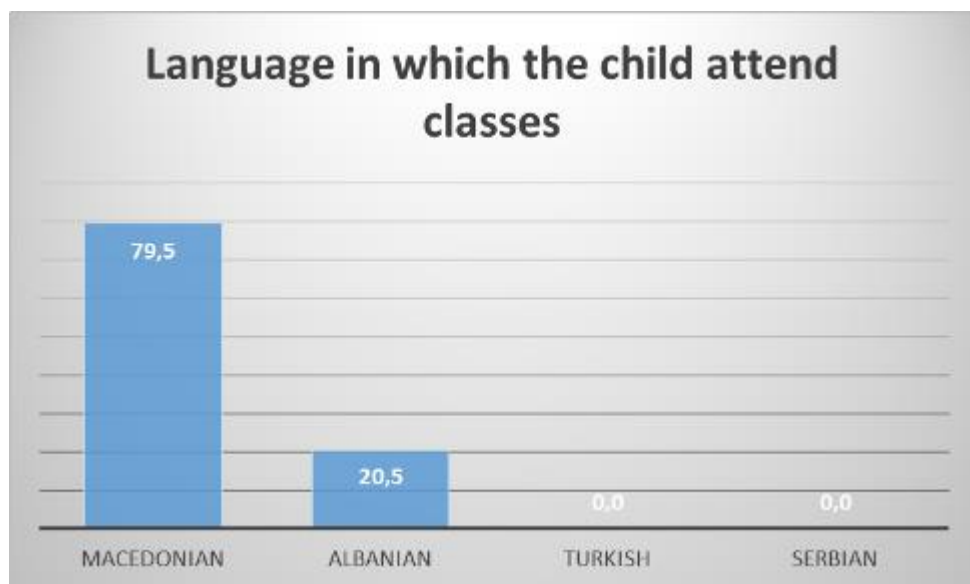
Figure 54: Language in which children of surveyed parents attend classes

The surveyed parents had children who were mainly in second (48.3%) and third grade (46.4%), which coincided with the children being tested with EGRA and EGMA tools.
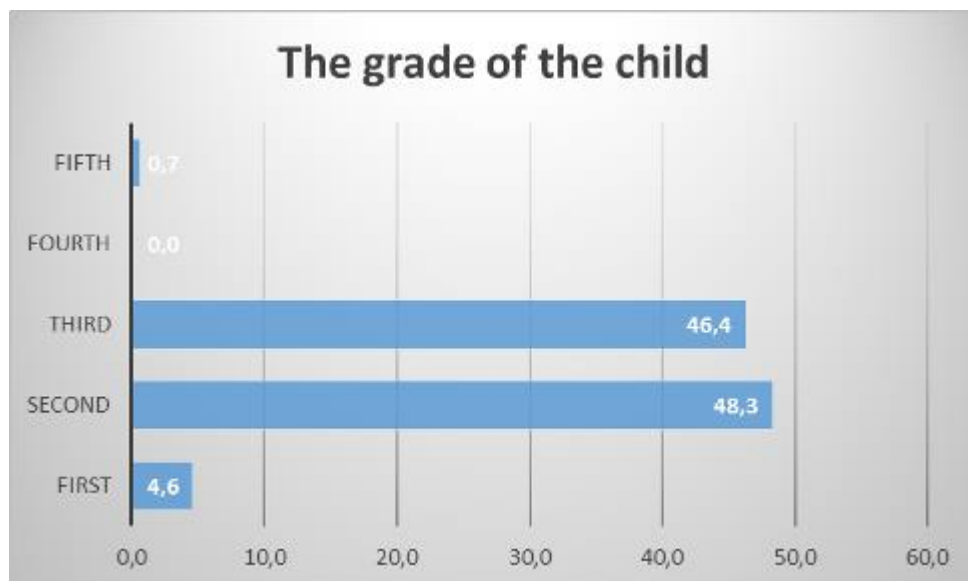
Figure 55: Grade in which are children of surveyed parents

Parents reported that 58% of their children have attended kindergarten, while 42% have never attended pre-school education.
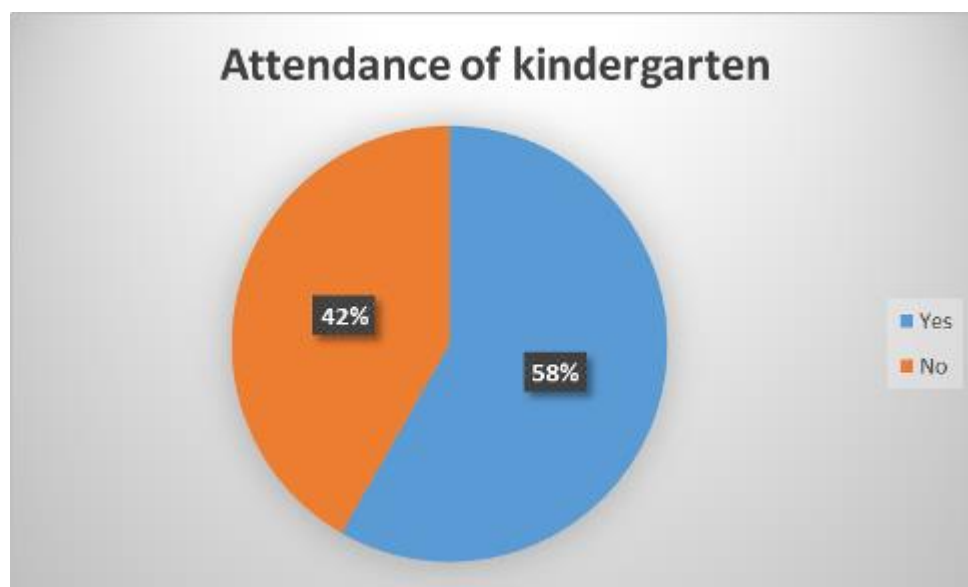
Figure 56: Children's attendance of preschool

Majority of surveyed parents (79%) were not members of the Parents' Council in the school.
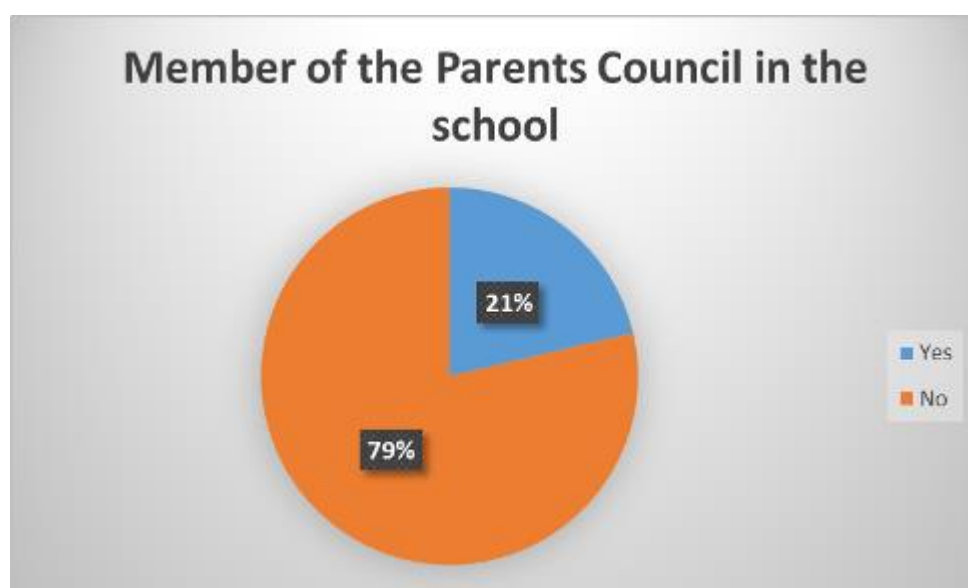
Figure 57: Membership in Parents' Council

8. FINDINGS FROM BASELINE QUESTIONNAIRES

The section below presents the main findings from the baseline questionnaires, grouped in several areas relevant for the project: availability of learning materials and equipment in early grade classrooms, teachers' training needs, school practices, pedagogic oversight as well as the parental involvement at schools and at home.

8.1 Availability of learning materials and equipment in early grade classrooms

For one classroom to be an effective learning environment, it should be appealing for students, with flexible activity centers, nicely decorated by the students, teachers and parents with contents reflecting the interests of students and instruction goals.

As part of a previous USAID-funded project (the School Renovations component within the Primary Education Project), Step by Step Foundation provided training for all renovated schools in "Creating Effective Learning Environment" to provide teachers with options for classroom management and a range of choices to meet the individual interests and needs of children. The main purpose of the training was to provide stimulating, safe and comfortable learning environment for all children, where interests, individual competencies, personal learning styles, and cultural values of all children are recognized and respected. To assist teachers in creating effective learning environments, the renovated schools were also provided with a package of educational equipment and didactic materials.

Almost half (44%) of all 41 schools selected for pilot and phase 2 of Readers are Leaders project and 48% of 27 visited schools have previously attended the training on creating effective learning environment. Because the real benefit of this training was gaining practical knowledge and designing activities for turning the classrooms into child-centered and stimulating learning environment as well as providing didactical equipment that would facilitate the process, this was considered as an important indicator in the analysis of

availability of equipment and materials in the classroom (please see more under the topic on Training needs assessment, Section 2.2).
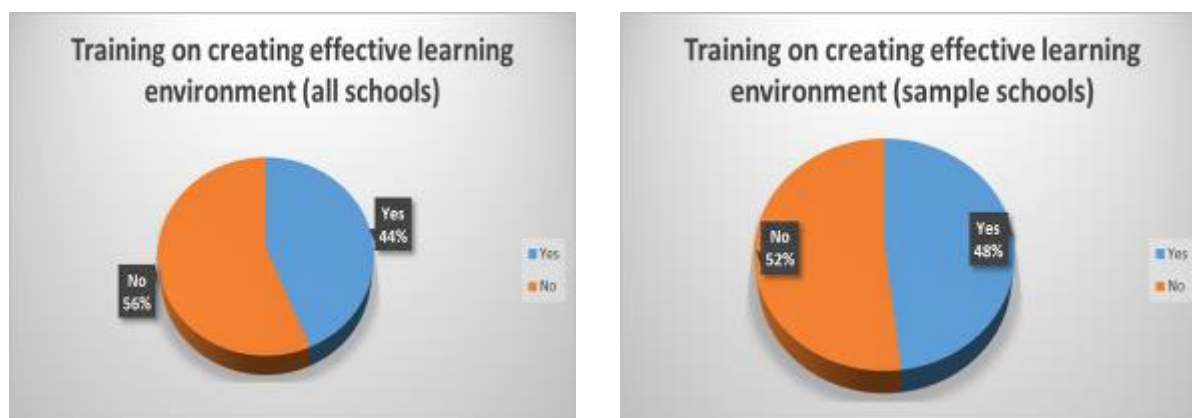
Figure 58: Attendance of training on creating effective learning environment

The average number of students in visited classrooms was 18, but they ranged from 13 to 33 students in one classroom. In the classrooms with large number of students (more than 25) it is very difficult to create effective learning environment and organize work in small groups or activity centers.

Photo 1: Most of the rural schools with Albanian language of instruction are crowded

Pedagogic materials are essential for both pupils and teachers. Teachers need textbooks and reference materials to help them properly follow the curriculum. Teaching instruments such as blackboards, chalk, writing materials, and pupil registers are fundamental teaching tools. Similarly, pupils need to have access to textbooks, reading books, exercise books or slates, math manipulatives, and writing utensils.

In 41% of visited classroom there are no books available for the children to read in the classroom, but in equal percentage of classrooms (41%) there are more than 10 story books and other reading material available for the children.
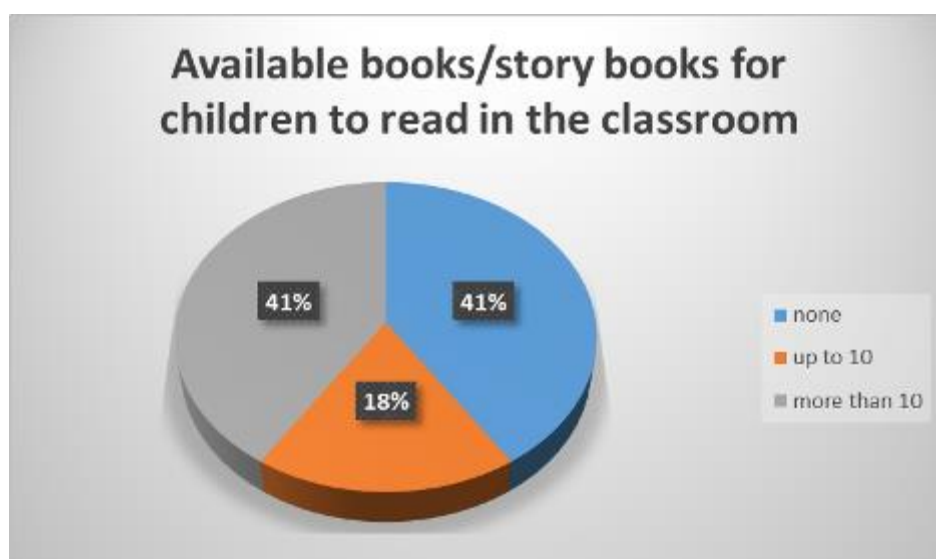
Figure 59: Number of available books for children in the classroom

According to the school location, none of the rural schools have more than 10 books available for early grade students, while majority (87.5%) have no books. The situation is more favorable in the urban schools where more than half (57.9%) have more than 10 books available in the classroom. However, in 21% of urban schools, no books are available in the classroom either.
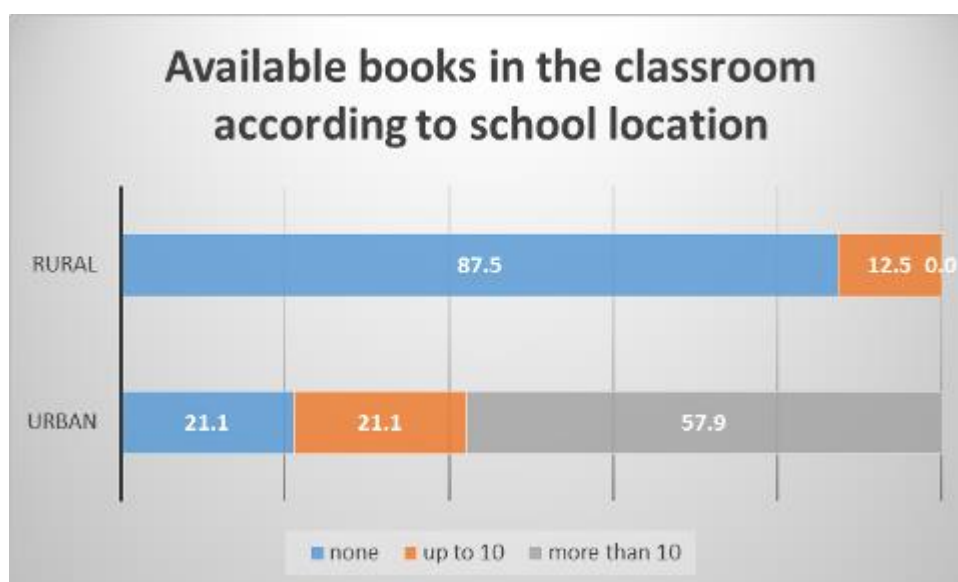
Figure 60: Number of available books for children in the classroom according to school location

The availability of books in the classroom also varies according to the language of instruction. In all schools with Albanian language of instruction there are no books available in the classrooms. In bilingual schools, 75% have no books available, while 25% have more than 10 books available in the classrooms. However, the observation protocol does not provide details on the language of the available books. More books are available in the schools with Macedonian language, with 52.6% schools having more than 10 books

available in the classroom. However, in 21% of Macedonian schools no books are available in the classroom.
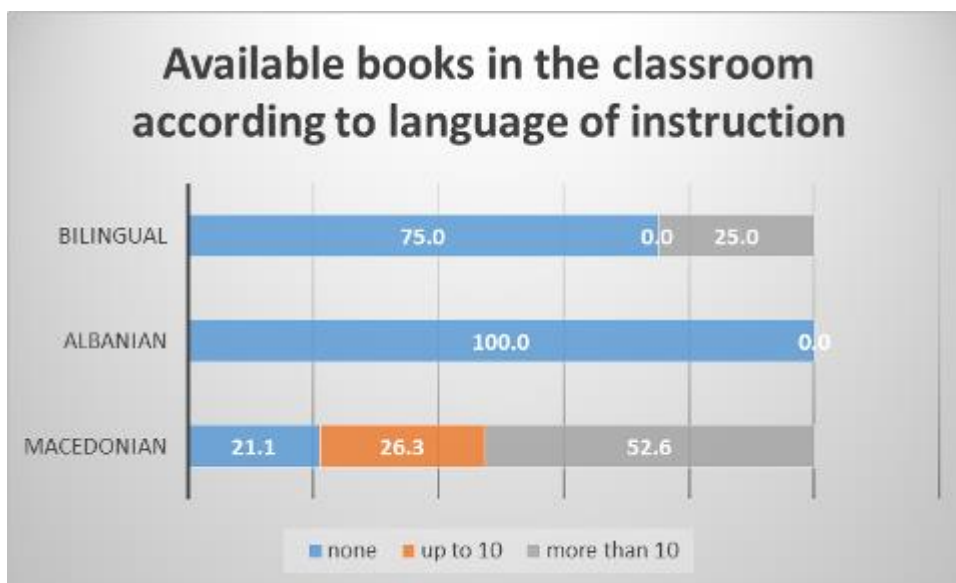
Figure 61: Number of available books for children in the classroom according to language of instruction

In majority of classrooms (81%) student projects and works were displayed on classrooms walls, mostly in urban (63%) compared with rural schools (18.5%).
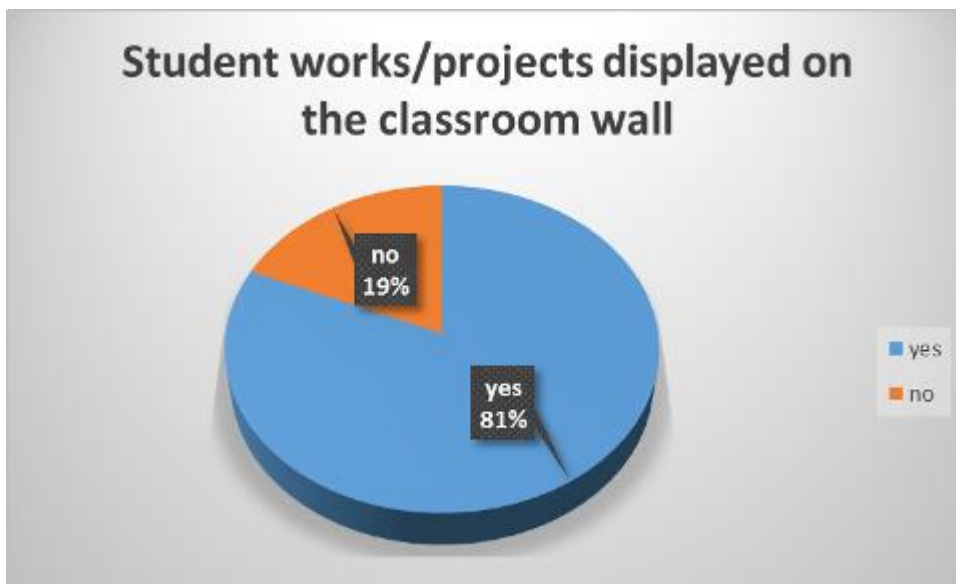
Figure 62: Student works displayed on classroom walls
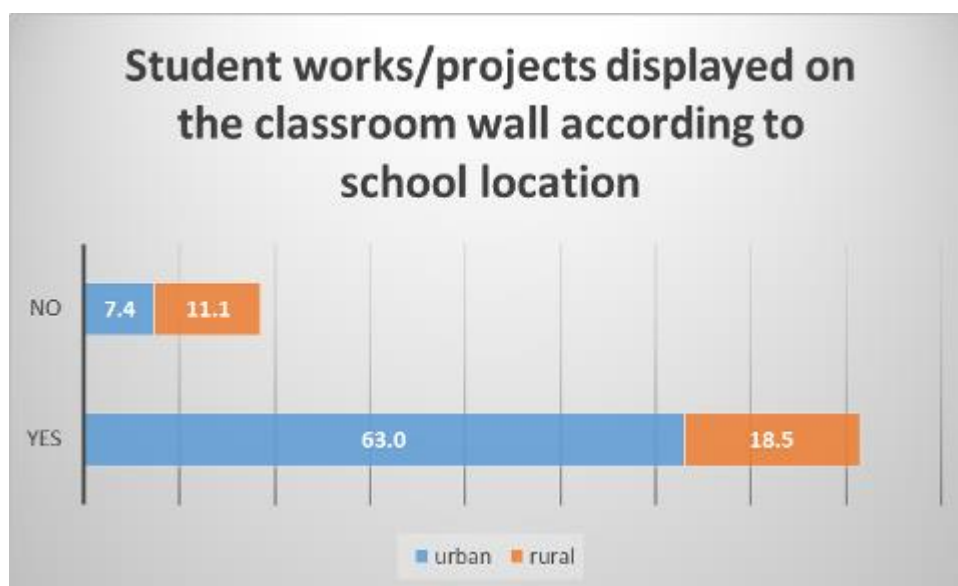
Figure 63: Student works displayed on classroom wall according to school location

However, in almost all of the visited classrooms (93%) teaching materials are displayed on the walls.
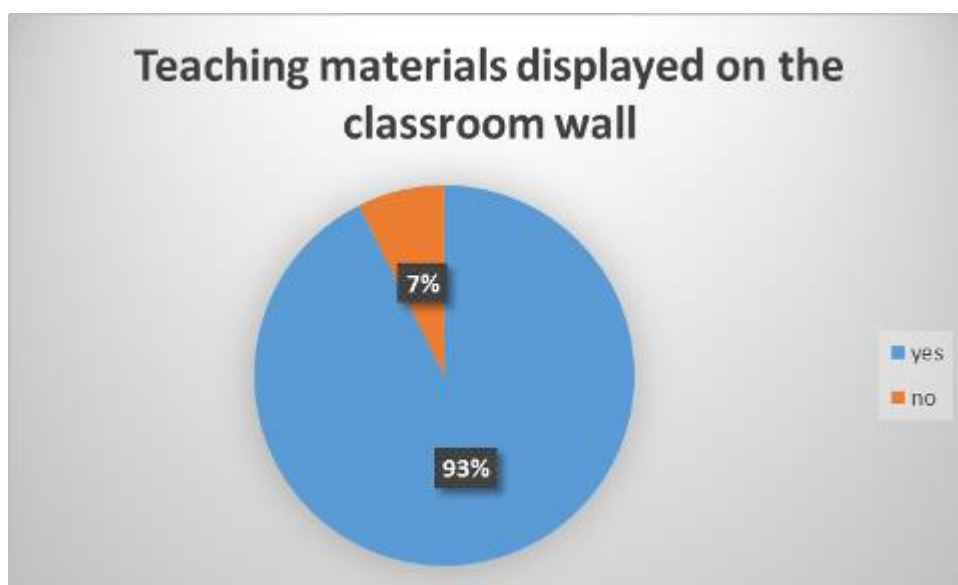
Figure 64: Teaching materials displayed on classroom wall

The different look of classrooms where teaching materials and student works are displayed on the walls is presented in Photo 2.

Photo 2: Classroom in which student works and teaching materials are displayed on the walls and classroom with empty walls

In classrooms where no student works were displayed, the teachers complained that it was impossible to do this because of the split-shift schooling as the early grade students shared the classroom with students from higher grades that ruin the works of the younger ones discouraging them to display their works.
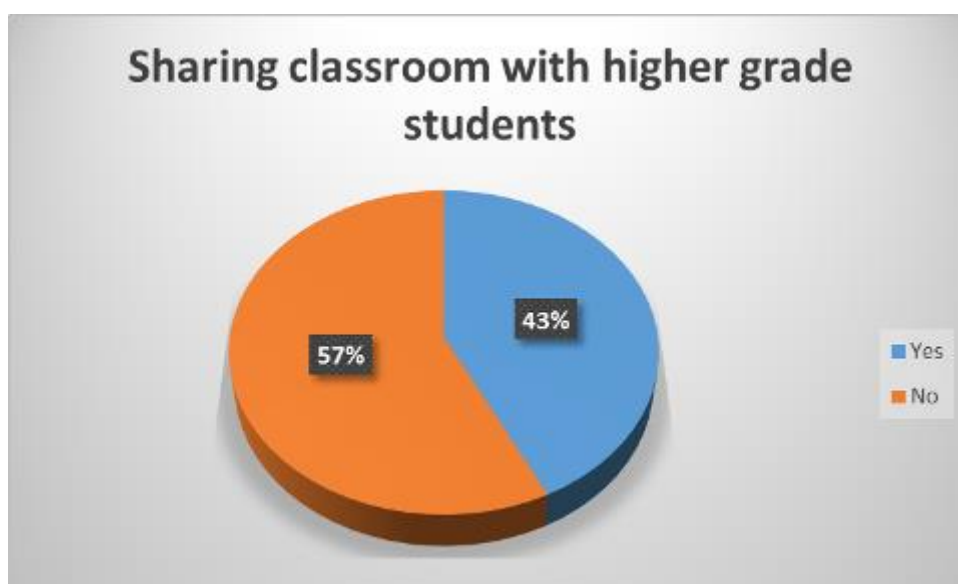
Figure 65: Shared classrooms between early and higher grade students

The basic furniture in classrooms consisted of desks and chairs, but an important feature of the effective classrooms is for the furniture to be easily moved and rearranged, to stimulate group work, interaction and effective communication.

In the age of modern technology, computers become important part of the learning process since early grades. The Government of the Republic of Macedonia provided schools with Intel Classmate laptops for the early grade students, and desktop computers for higher grade students.

In more than half (59%) of the visited classrooms, the classmate computers are still available to the students, while in 11% of the classrooms there are either only desktop computers or

both desktop and classmate computers. In 19% of the visited classrooms, the schools reported that there were no computers mainly because of theft of computers on school level.
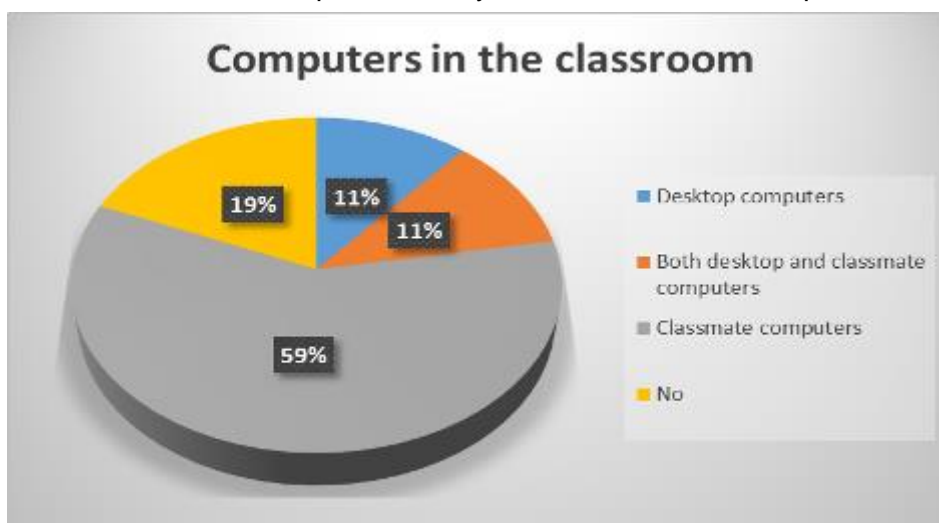
Figure 66: Computers in the classroom

The availability of computers directly affects the learning environment in the classrooms, especially the desktop computers, which are with fixed position because of the wiring, making the sitting arrangement in the classroom not flexible, as the desks cannot be arranged for work in small groups.

In more than half of the classrooms (60%), the desks and chairs are arranged in such way to stimulate group work.
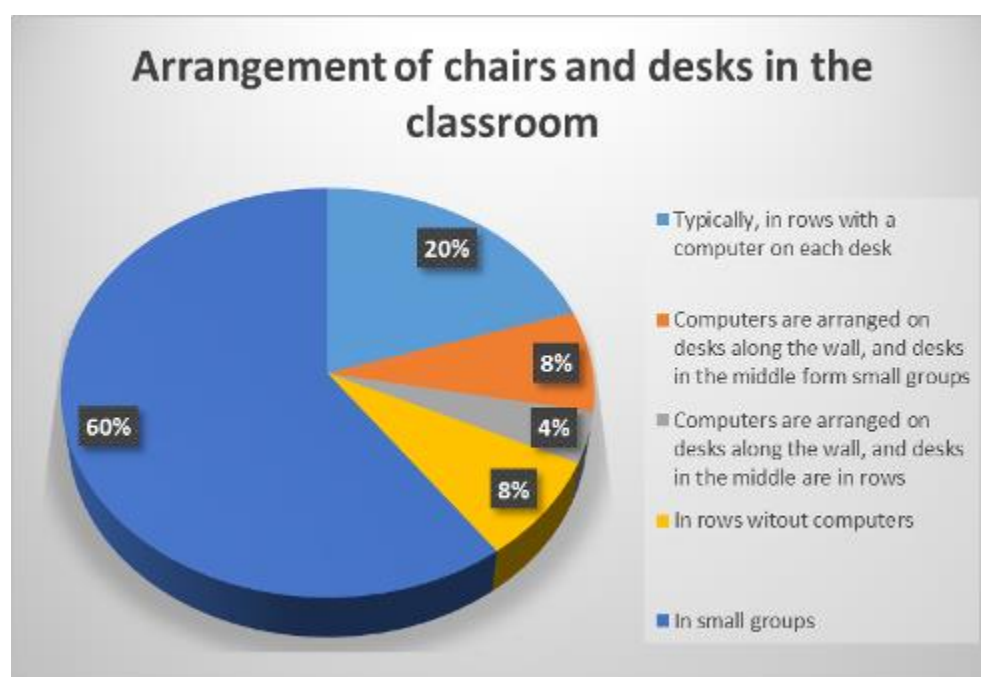
Figure 67: Arrangement of chairs and desks in the classroom

However, in 20% of the classrooms the desks are arranged in rows, with fixed desktop computers that cannot be moved, while in 8% of the classrooms although there are no computers, the desks are still in rows as in traditional classrooms. Another solution observed in the classrooms is the desktop computers to be arranged on desks along the walls allowing for the other desks to be grouped in the middle, either in rows (4%) or in small groups (8%).

Photo 3: Effective learning environment with different arrangement of desks and chairs (in rows and small groups)

The availability of materials for the teacher is also very important for providing effective instruction. Of the surveyed teachers, all of them (100%) reported having and using lap top computer for the instruction process. These laptops were also provided by the Government of Macedonia back in 2009, so now the teachers have problems with their maintenance, which is no longer covered by the school.
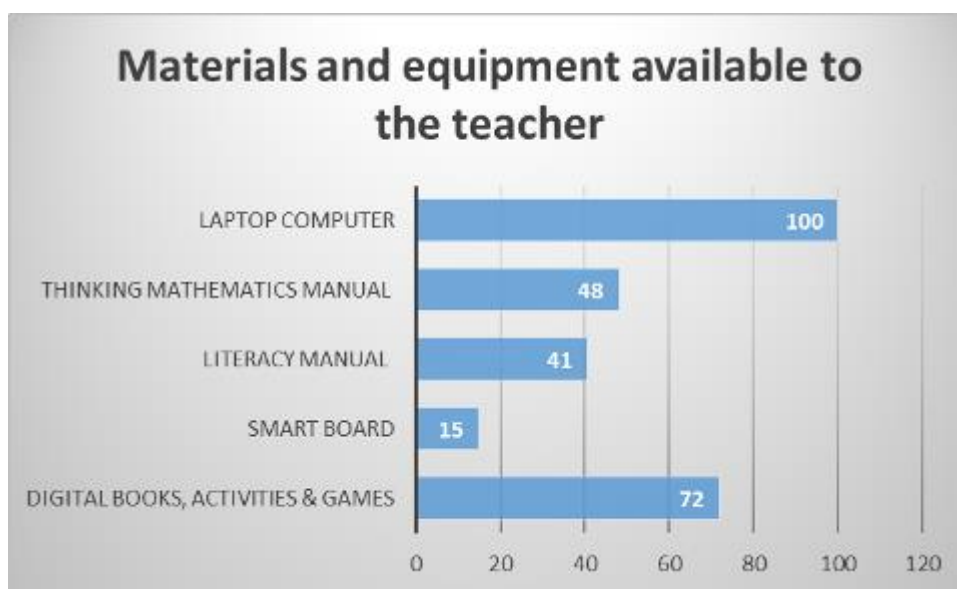
Figure 68: Materials and equipment available to the teacher

Total of 72% of teachers reported using digital books, activities and games with the students, mainly referring to ToolKid and G-compris, educational software developed within the USAID Primary Education Project. They also use the green package or presentations available on CDs. The teachers complain that they are in need of new and more digital activities to be used in the classroom, as they are currently using educational games or audio stories in

foreign languages (mainly from the neighboring countries) in order to make the instructional process more innovative and creative.

Small percentage of teachers (15%) have smart boards available in their classrooms, but they also need new digital activities for the smart board. More than 40% of the teachers use literacy (41%) and mathematics (48%) manuals, developed for the purpose of UNICEF-funded initiatives "Thinking Mathematics for the Early Grades" and "Teaching Reading for Comprehension and Writing in the Early Grades". When asked whether they need additional manuals, they all said they need more resources for both in-class and after-class activities.

Effective and creative learning environment should also stimulate different types of learning based on student interests, so the classroom should be divided into activity centers. An activity center is a separate space within the classroom with various materials available for students, so that they are able to choose activities according to their capabilities and interests. Each activity center should have its own space and should be marked appropriately. The centers should be equipped with shelves and boxes for keeping the materials and each child should be able to find, use and return the necessary materials.

Of the visited classrooms almost half of them (48%) were divided into activity centers.
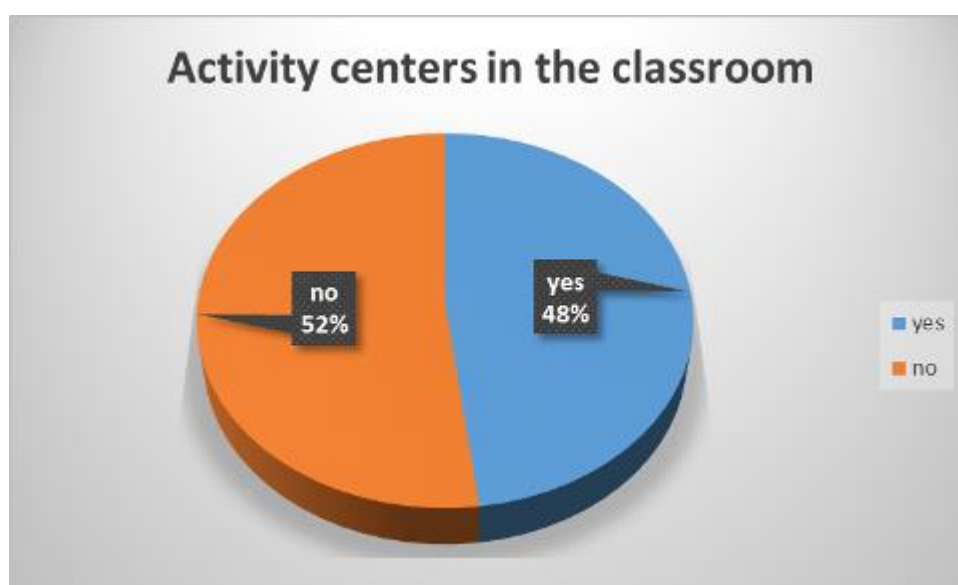
Figure 69: Activity centers in the classroom

The Normative prescribing the space, equipment and teaching aids for 1st to 6th grade of the Nine Year Primary Education in the Republic of Macedonia prepared by the Bureau for Development of Education and the Ministry of Education and Science notes that the following activity centers should be available in the classrooms: literature, mathematics, science, art, family/drama and computer center.

Almost all of the visited classrooms with activity centers have these prescribed centers. In some of them there is a daily activity of students, while in others they serve only as exhibition points of student works and projects.

- **Reading Center** (writing and listening) – The purpose of this center is for reading books, magazines, listening to stories or music, writing. They are mainly equipped

with books, encyclopedia, posters, poetry or stories written by the students. In some classrooms there are small libraries created by children and parents.

Photo 4: Learning materials in the Reading Center

- **Math Center** - equipped with counters, abacus, three dimensional figures, puzzles, domino, rulers, scales.

Photo 5: Learning materials in the Math Center

When school directors were asked whether the school has bought any didactic materials in the past three years, 45% of them said yes, while 55% said that no materials were supplied in this period.
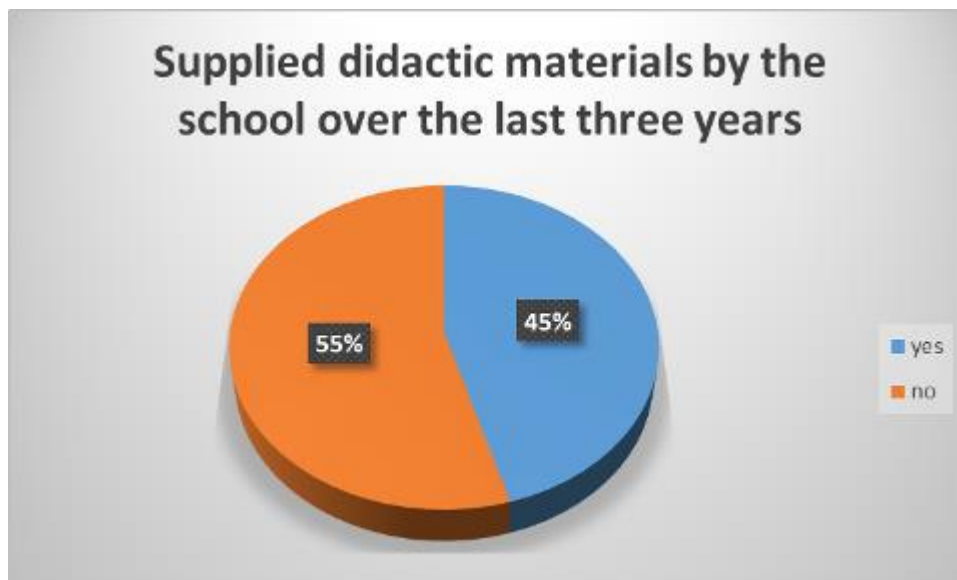
Figure 70: Supplied didactic materials in the past three years

- **Art Center** - equipped with variety of paper, coloring pens, wax crayons, colored chalks, water colors, clay, newspapers, scissors, etc. Most of the student art works are displayed in this center.

Photo 6: Student works in the Art Center

- **Science/ Research Center** - where children can do some simple experiments, grow plants (environmental), use clay, magnets, scales, plants, leafs.

Photo 7: Growing plants in the Research/ Science Center

- **Computer Center** - teachers usually label as computer center the rack where the classmate computers are kept. These are computers with educational software, adjusted to the student age and interests. Usually classmate laptops are used several times per week and then the entire classroom is turned into a large computer center.

- In many classrooms there is also an **ethnology center** with objects, dresses belonging to different ethnic groups in Macedonia, collected or made by the students, together with their family members.

Photo 8: Computer Center
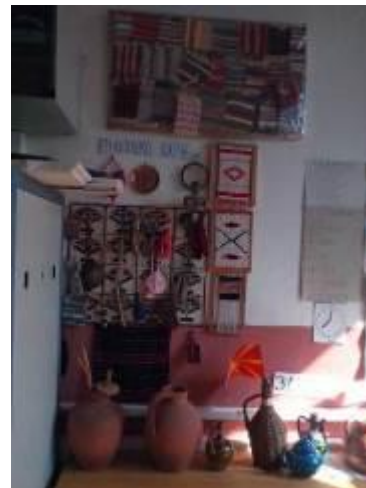
Photo 9: Ethnology Center

- **Music Center** is also common in many classrooms. The students usually have tape recorder/player and they can listen to some music, but also different instruments are available so they can create either their own music or play the songs they have practiced in music classes.

Photo 10: Instruments and tape player in the Music Centre

In most of the classrooms, code of conduct or simple rules for the students were displayed on the walls, instructing them how to behave in the classroom and what is considered as appropriate conduct.
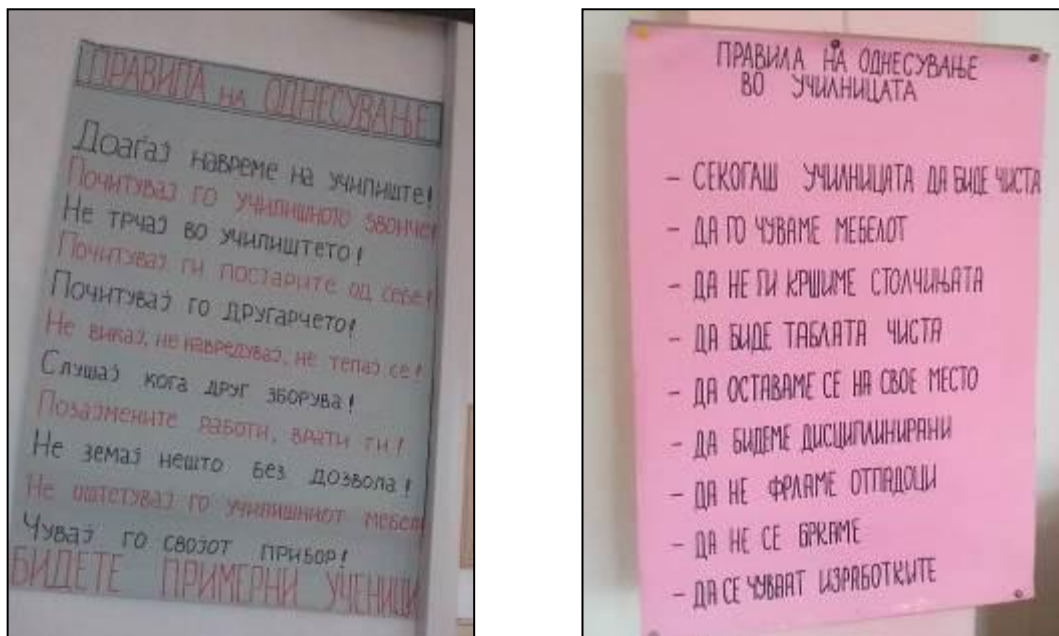
Photo 11: Classroom Rules as part of the Code of Conduct

More than half of the schools organize after-class activities for early grade students aimed at improving their mathematics (63%) and reading (67%) skills.
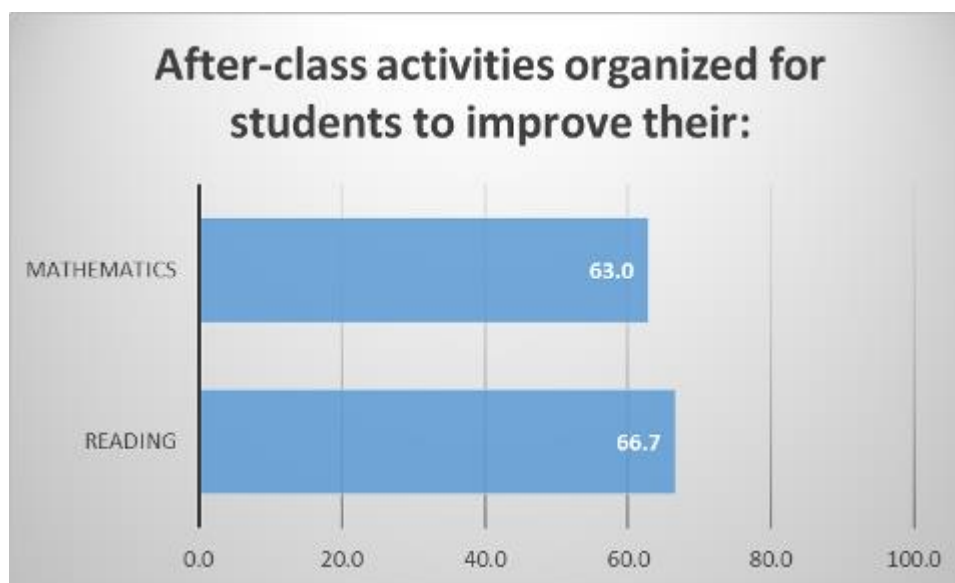
Figure 71: After-class activities in reading and mathematics

The after-class reading activities mainly include reading by the teacher or reading in groups, poetry and/or drama reading, poem competitions, literature quiz, preparation of theater plays, visits to city libraries or cultural events. One school reported that the city library grants free access to all first-graders at the beginning of the school year.

Activities for improving early grade math skills include math quizzes and competitions, exercises for improving the concentration, activities for logical and critical thinking.

Majority of schools (93%) have school library, which is fully accessible for early grade students.
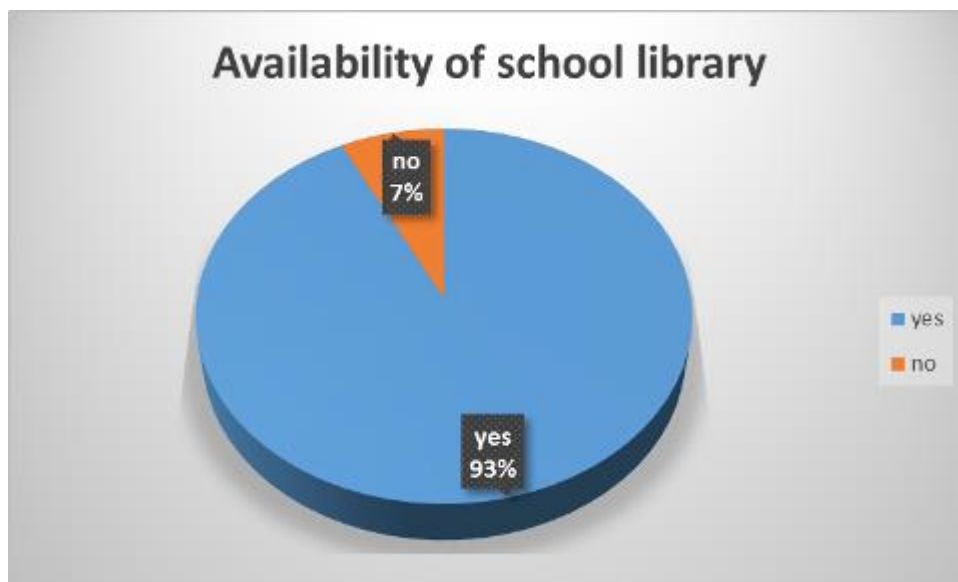
Figure 72: Availability of school library

In one school, the library is under construction, while in another school there is no available space to serve as a library. Not all schools keep the books in an appropriate place due to the limited space in the school premises.

Photo 12: Different types of school libraries

Majority of interviewed teachers, librarians (63%) and two thirds of school directors (66.7%) reported that additional books are available in the library for the early grade students in addition to the books from the compulsory reading list.
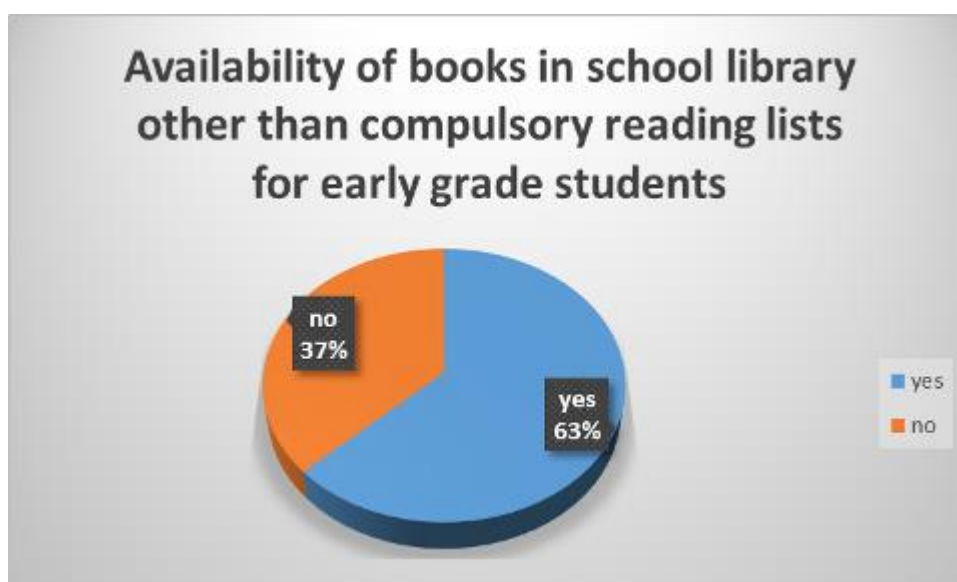
Figure 73: Availability of books in school library for early grade students

However, this availability of books varies according to the location of the school. Additional books for early grade students other than the compulsory reading lists are available in 52% of the visited urban schools, but only in 18% of the visited rural schools.
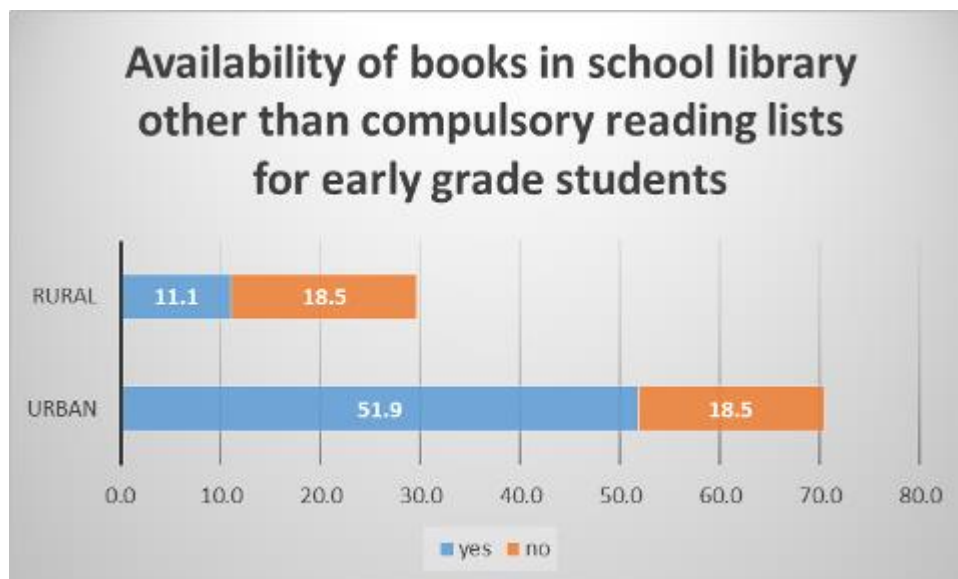
Figure 74: Availability of books in school library according to school location

Furthermore, according to the language of instruction, there are no additional books in the libraries for early grade students in all Albanian schools (100%) and in a quarter of bilingual and Macedonian schools. However, during the field visit hardly any student let alone early grade student was present in the libraries.
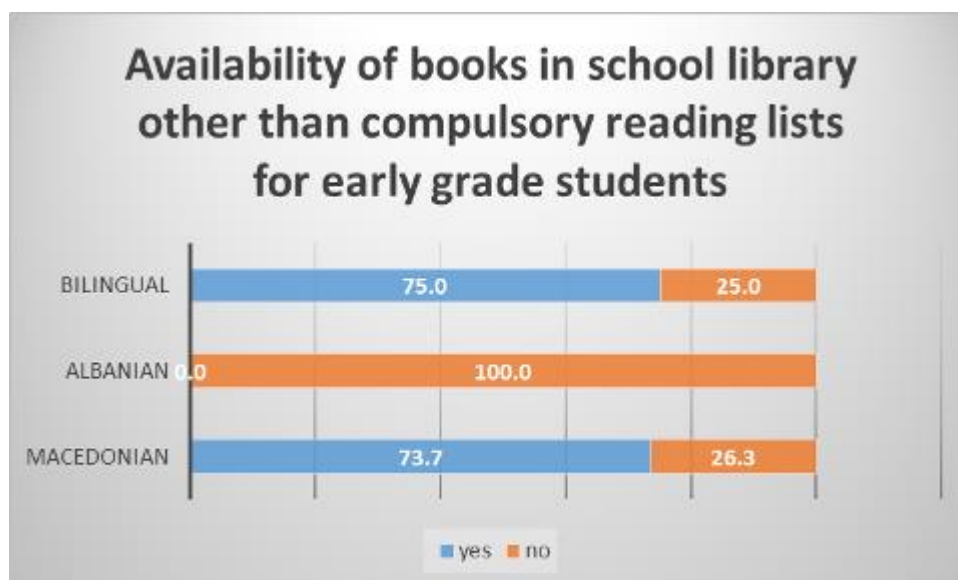
Figure 75: Availability of books in school library according to language of instruction

Summary of results:
- Generally, there is a lack of books in the early grade classrooms, available for students to read during class. The availability of books is very low in Albanian language as well as in rural schools;

- Most of the classroom walls are suitably decorated with student projects and teaching materials. However, the desks and chairs are not always arranged in a way to stimulate group work nor the classrooms are divided into different activity centers;
- Most of the teachers use the classmate computers and various digital books, activities and games with the children on a weekly basis;
- Schools organize after-class activities for early grade students aimed at improving their mathematics and reading skills, but they are mainly in the form of organizing competitions for best poem or story or participation in math competitions organized on national level;
- Almost all schools have school library, which is fully accessible for early grade students with books other than those from the compulsory reading list.

8.2 Teachers' training needs assessment

One of the main project goals is to improve teaching and student achievements in reading and numeracy, by developing literacy and numeracy assessment capacities of teachers as well as their understanding and mastery of interactive methods that stimulate improved math and reading skills.

With an aim to tailor the professional development activities to the actual needs of the early grade teachers, the project team conducted training needs assessment in order to be able to provide adequate guidance and professional development to early grade teachers for their own professional growth, improvement of teaching practice and raising student achievements.

On several occasions, during the school visits for classrooms observation, the training for administration of EGRA and EGMA tools, but also during the events organized in the schools as part of Component 5: Family and Local Community Involvement, teachers were repeatedly asked to point out the topics in which they need additional training for the purpose of promoting the literacy and mathematics skills among early grade students. Also, some of the questions in teachers' questionnaires referred to the previous experience and training of teachers in early grade reading and mathematics.

Description of the results:

Based on the teachers' responses in the questionnaires, almost half of them (52%) have attended a training workshop on literacy, more specifically on teaching students how to read, while 48% have never attended such workshop.

Attended training course for teaching students how to read

48% 52%

Yes
No

88
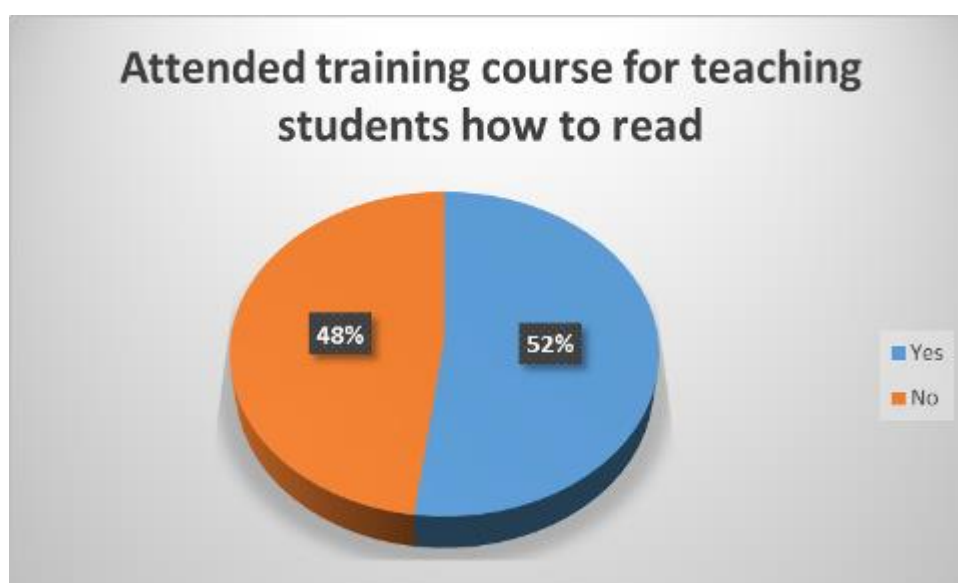
Figure 76: Percentage of teachers that attended training on teaching students to read

The situation is rather different for training in mathematics, where 85% of surveyed teachers answered that they have attended workshop for teaching math.
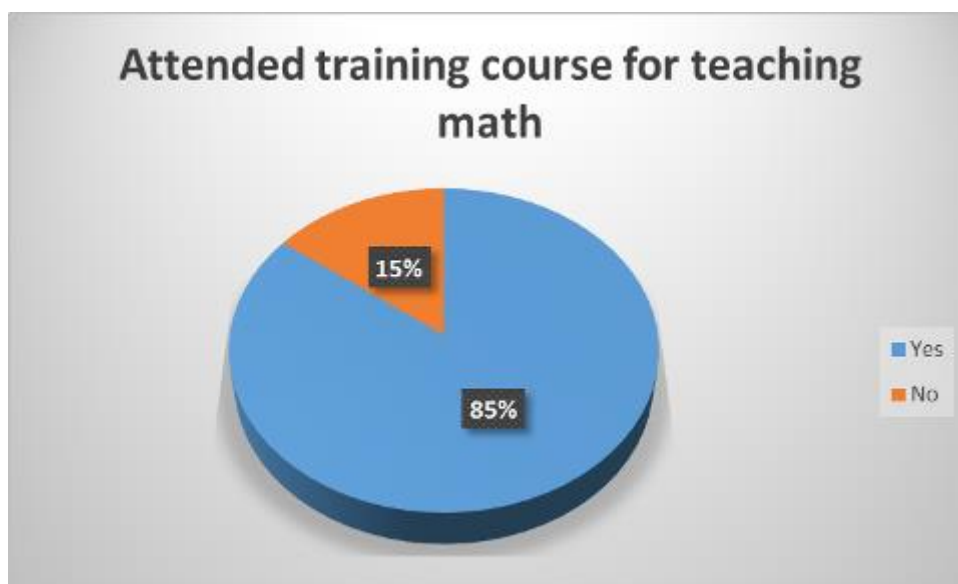
Figure 77: Percentage of teachers that attended training on teaching math to students

During the observation of the classrooms, the teachers expressed their satisfaction with the previous training in creating effective learning environment and recommended the training to be extended to other teachers in school, due to the limited scope of the previous workshop delivered to around 10 teachers per school within the USAID Primary Education Project.

Figure 78: Percentage of schools that attended training on creating effective learning environment

The analysis showed that from all 42 schools involved in pilot and phase 2 of project activities, the training was delivered in 44% of the schools. Some of the interviewed teachers said that this training was provided for teachers either in the central or satellite school, when in fact it could be useful for all early grade teachers. Furthermore, some teachers that already attended the previous workshop asked for updated and advanced training in this topic.

Closely related with this topic is also the training in "Parental and Community Involvement in Schools" which was aimed for parents and school officials to improve parental involvement in schools. The general goal of the training was to stress the importance of, and benefit from, parent and community involvement in improving the school environment, both internal and external. Interviewed teachers reported that similar training with more focus on involvement of parents in enhancing literacy and mathematics skills of their children could be important and useful. This workshop could include practical tips on how parents can read with their children and use mathematics in their daily life.

Another topic emphasized by the interviewed teachers was teaching reading and math to students with disabilities. The responses to the questionnaires showed that one quarter (25%) of surveyed early grade teachers had students with special needs in their class. The main identified problems is the development of individual lesson plans and formative assessment of students with disabilities. In addition, teachers have problem to recognize and address the learning difficulties of children such as, dyslexia, dyscalculia and dysgraphia.
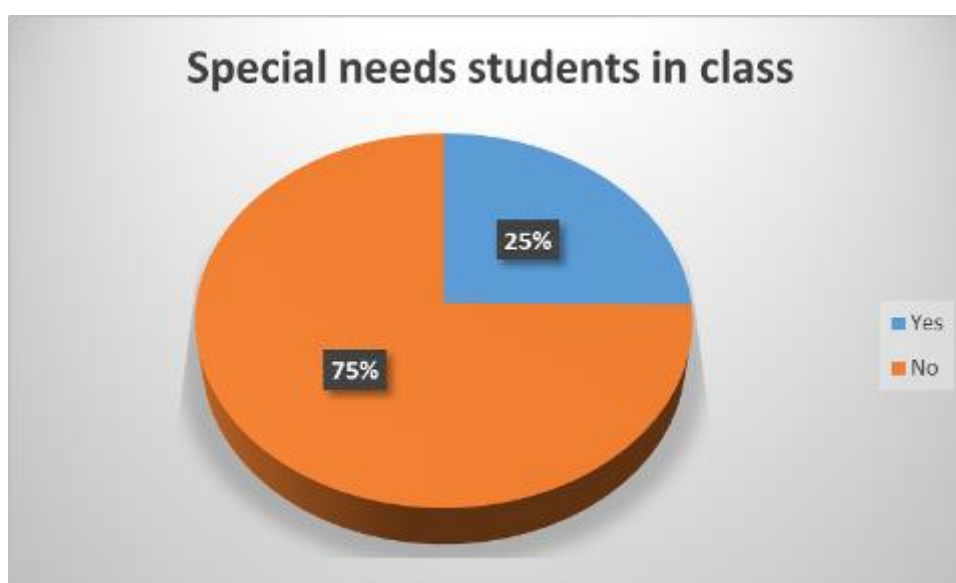
Figure 79: Percentage of early grade teachers that have students with special needs in class

When early grade teachers were asked how they deal with student that have poor results, almost half of them (49.7%) said they pay them more attention, one quarter (24%) provide them with more didactic materials and 16.4% try to give them more encouragement. None of the teachers use the students with better results to share their knowledge with their fellow students and low percentage (8.2%) involve the parents in these activities.
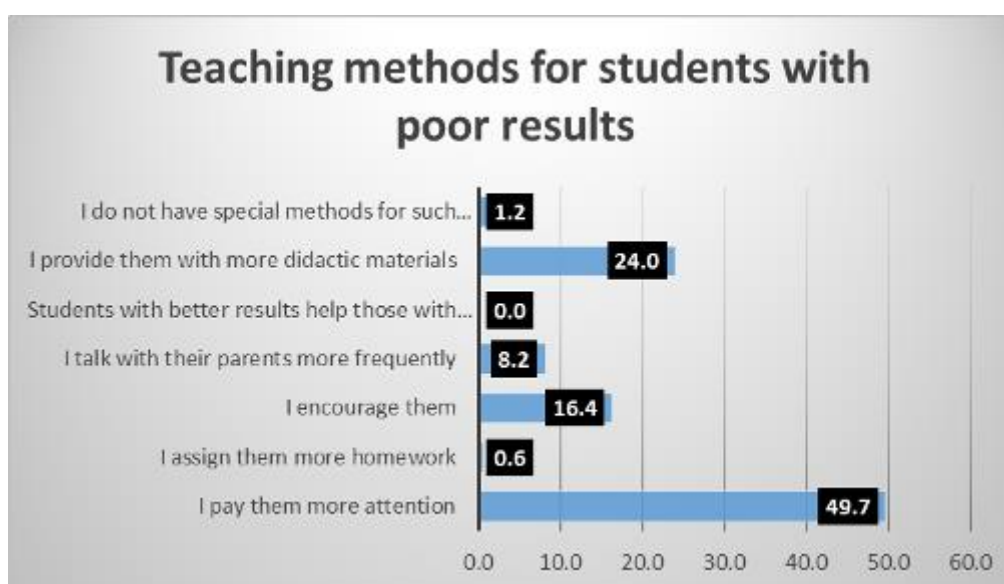
Figure 80: Teaching methods applied by teachers for students with poor results

Based on interviews with teachers and their responses to the questionnaires, other training topics addressed by the teachers as useful are the following:

- Dyslexia, dysgraphia and dyscalculia as specific learning difficulties: dyslexic student in a classroom, symptoms of dyslexia, reading and writing techniques for dyslexic and dysgraphic students;
- Formative assessment for early grade students;
- Techniques for acquiring early grade reading and writing;
- Creative Math;
- Classroom strategies that foster reading and/or writing motivation;
- Models for work in activity centers;
- The role of the teacher: How should the teacher stimulate the learning process in children;
- Workshops for parents: early reading and writing for children at home.

8.3 School practices

Worldwide, governments define the number of days or hours that schools should teach specific material, and curricular objectives must be covered within these specific numbers of hours or days. The 2005 UNESCO Education For All Global Monitoring Report[8] recommends 850 to 1,000 instructional hours or 180-220 days per school year, aside from breaks and extracurricular activities and the Education for All Indicative Framework expects at least 850 (or about 200 days at 5 days per week), as students must get sufficient time to master the instructional objectives intended in specific subjects.

Practices of well-managed schools suggest that they should stay open the number of days that governments specify, have few teachers absent, and ensure that students of absent teachers are engaged in learning and not in other non-instructional activities.

In Macedonia, the official school year lasts 180 days, with total of 828 instructional hours in Grade 2 and 864 in Grade 3, increasing in each subsequent grade level and reaching 1,116

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[8] http://unesdoc.unesco.org/images/0013/001373/137333e.pdf

instructional hours in grade 9. An instructional hour in Macedonia is set at 40 minutes. These numbers show that the number of instructional hours in Grade 2 is lower than UNESCO recommendations.

Primary school curricula can be classified into six subject areas: language, mathematics, natural science, social sciences, aesthetic education and physical education. On average, one-third of all instructional time in Grade 2 and 3 is devoted to language instruction; of this, about 26% of time is for national/official languages and 8% to foreign languages (or other local languages). About 22% of instructional time is devoted to math (180 instructional hours in both grades). The mean instructional time devoted to the other subjects is usually around 10% for each subject area, ranging from 4% for social sciences, 8.5% for arts and sciences, to 13% for physical education.

Description of the results:

The effective school practices prescribe that the school year should be implemented as planned, substitute teachers should be called for absent teachers, and parents should be attentive to student progress. So indicative school practices are teacher and pupil absenteeism as well as late arrival as these may reduce the effectiveness of the teaching time in classroom.

Based on school director reports, 97% of teachers are seldom absent (up to five working days per year or 3% of teaching time) and only 3% reported that teachers are often absent for up to 10 days per year, which is 5% of the total teaching time.
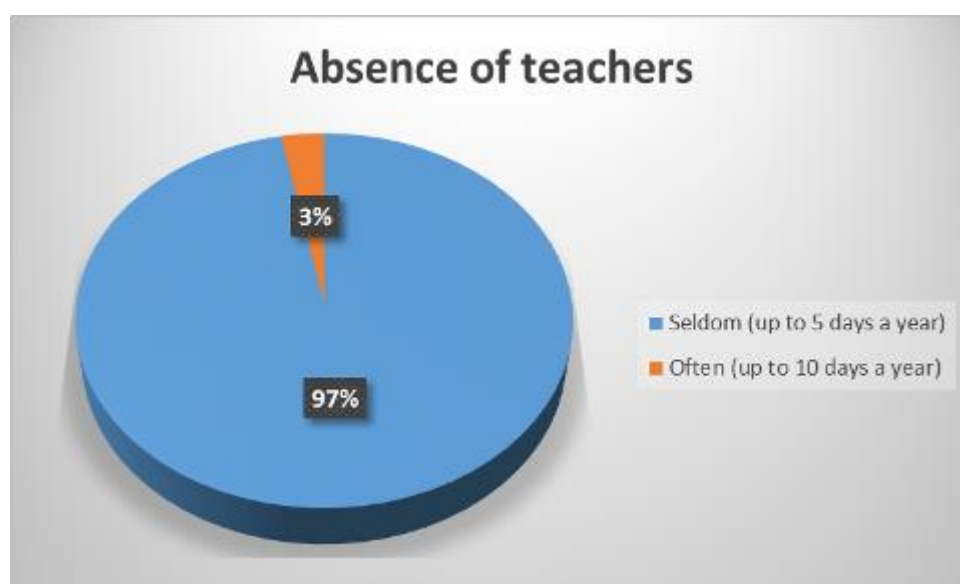
Figure 81: Absence of teachers during school year

Regarding the absence of students, teachers reported that almost one quarter (22%) of students are regularly absent from school.
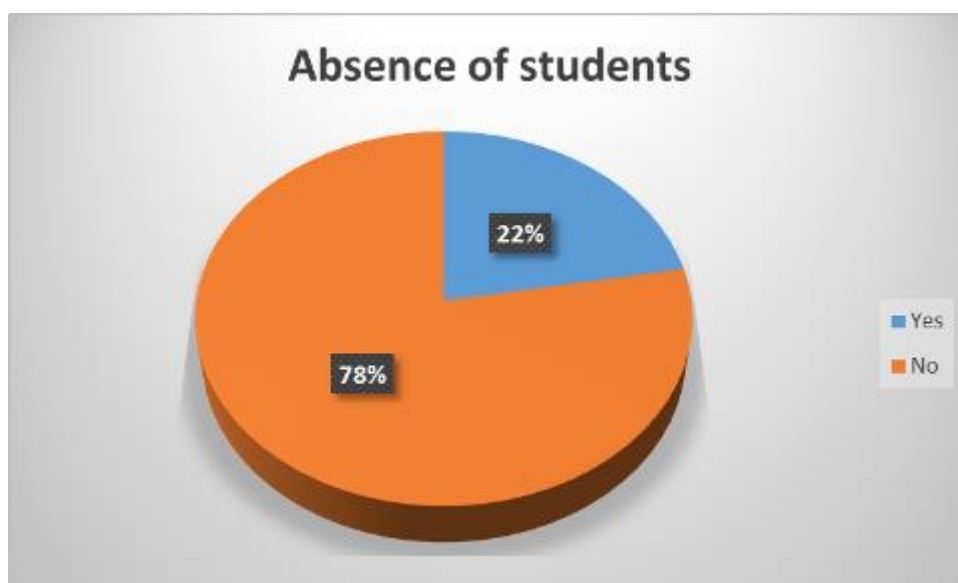
Figure 82: Absence of students during school year according to teachers

This percentage is similar to 23% of parents reporting that their children are often absent from school (three to ten days a year). However, majority of parents (75%) report that their children are seldom absent from school.
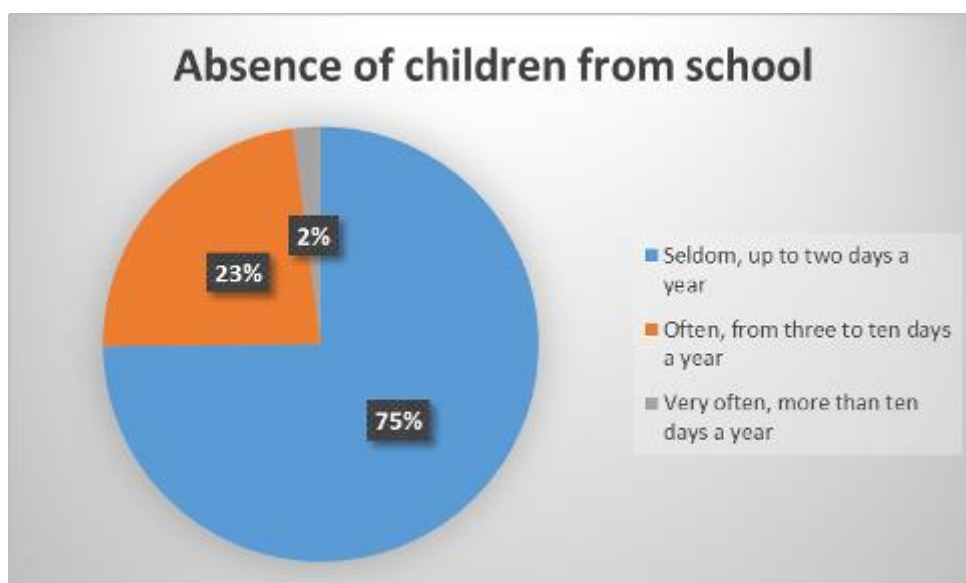
Figure 83: Absence of students during school year according to parents

Two-thirds of school directors reported that none of the teachers is late for classes, while 36% said only few were late. One should keep in mind that late arrival undermines pupils' learning time, and recurrent late arrival is associated with lower performance.
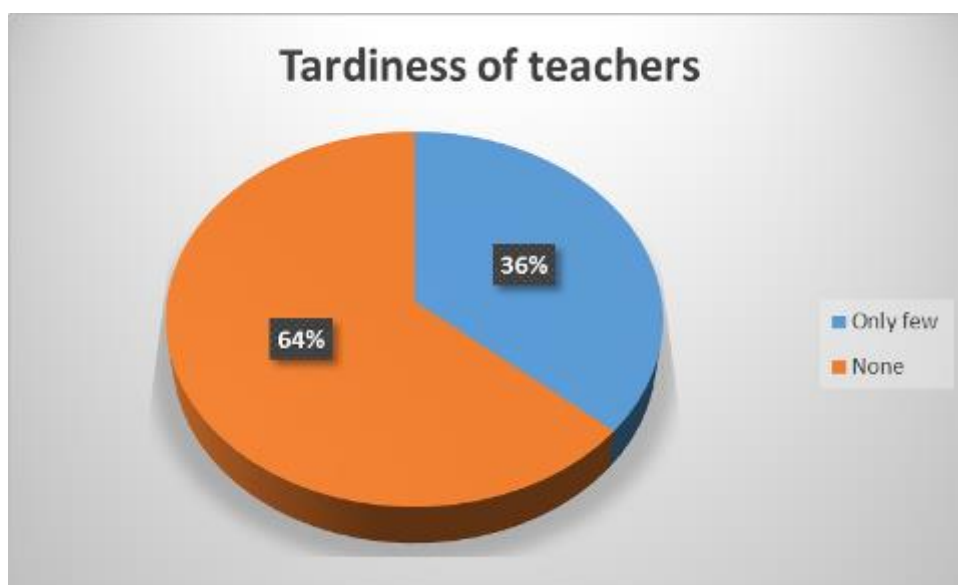
Figure 84: Teachers being late for classes

In case when the teacher is absent from school for the day, majority of school directors appoint appropriate substitute (54.5%) or teacher from another class (36.4%) for the students. In few cases, all students join another class (6.1%) or are transferred into other classes (3%).

Figure 85: Dealing with students when teachers are absent from school

With all schools having computer network, it is important to assess their access to internet. Through the USAID-funded MK-Connects project, all schools in Macedonia have gained broadband wireless access to the Internet. During the time of this assessment, this access was still available for schools, which is very important for the electronic data collection process for EGRA and EGMA with the help of tablet computers.

Although all school directors reported that their school had internet access, only 15% were satisfied with the speed and quality of the internet.
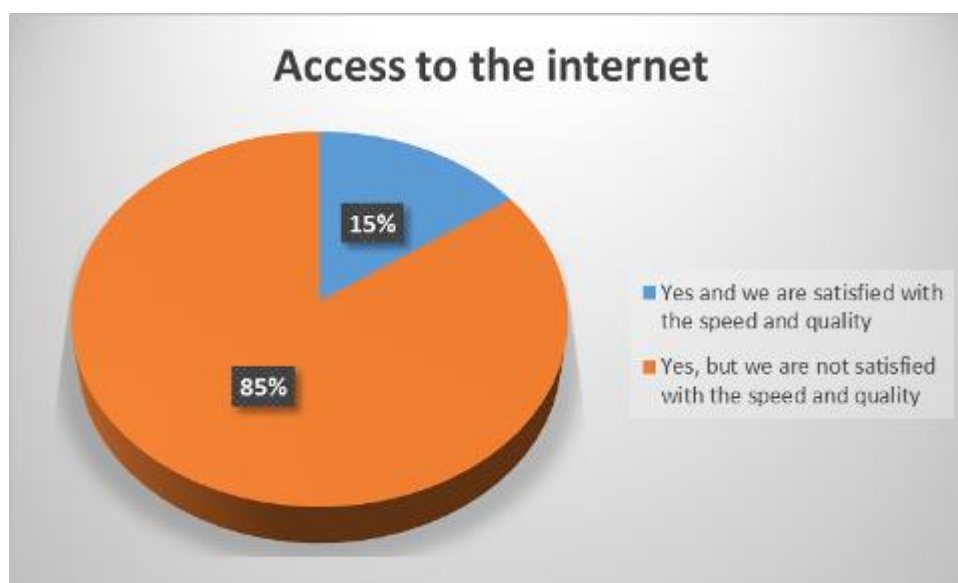
Figure 86: Access to Internet of schools

The interview with school directors showed that they are mainly dissatisfied with the limited options for upload and download of data, making other school practices that require internet (such as filling out the electronic register, downloading external tests and learning materials) difficult to perform. Furthermore, maintenance of classroom computers and teachers' laptops is a major problem for schools.

Summary of results:
- Few teachers are absent or late for classes in schools;
- Based on teachers and parents account, more than 20% of students are often absent from school (3-10 days per year);
- School directors have found solution for children whose teachers are absent, mainly by appointing an appropriate substitute for the day;
- Schools have internet, but there is a high level of dissatisfaction with the speed and quality.

8.4 Pedagogic oversight

Typically teachers have the obligation just to deliver the lessons, rather than ensure their mastery, and mere delivery can be done in relatively little time. Nominally, school directors and student support services (pedagogue, psychologist, and/or sociologist) should be doing internal quality control, while BDE advisors and education inspectors the external monitoring and evaluation.

The extent to which school directors are or are not involved with the day-to-day work of their teaching staff can be indicative of the management and oversight capabilities of school directors, the level of accountability felt by teachers, and the working atmosphere for staff.

Eighty-two percent of surveyed school directors said they monitored the teacher's performance directly through class observation, while 18% relied on quarterly reports on student progress submitted by the teachers.
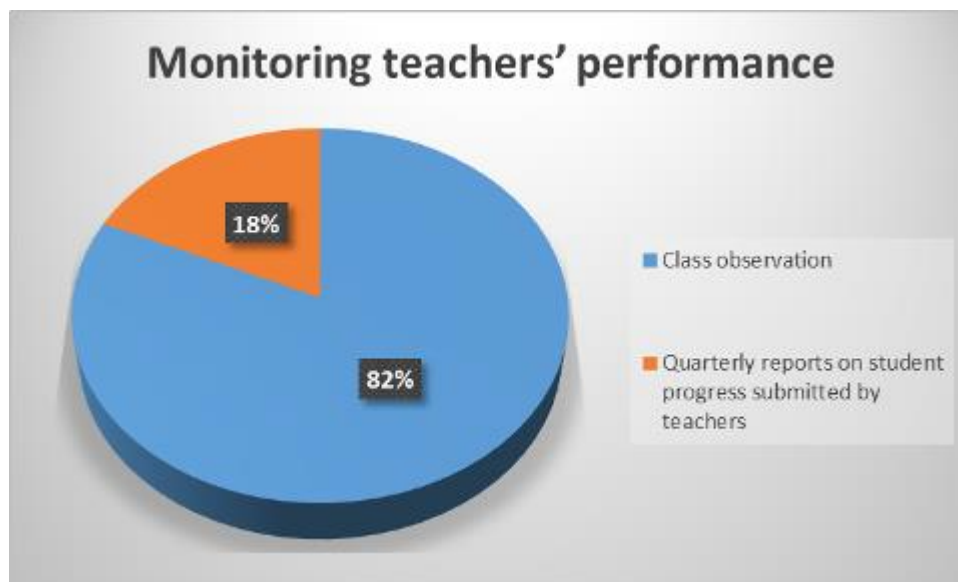
Figure 87: Practice of monitoring performance of teachers

Thirty-four percent of teachers reported school directors checking their lesson plans once a quarter, while 23% once a month and only 6% claimed this was done daily.
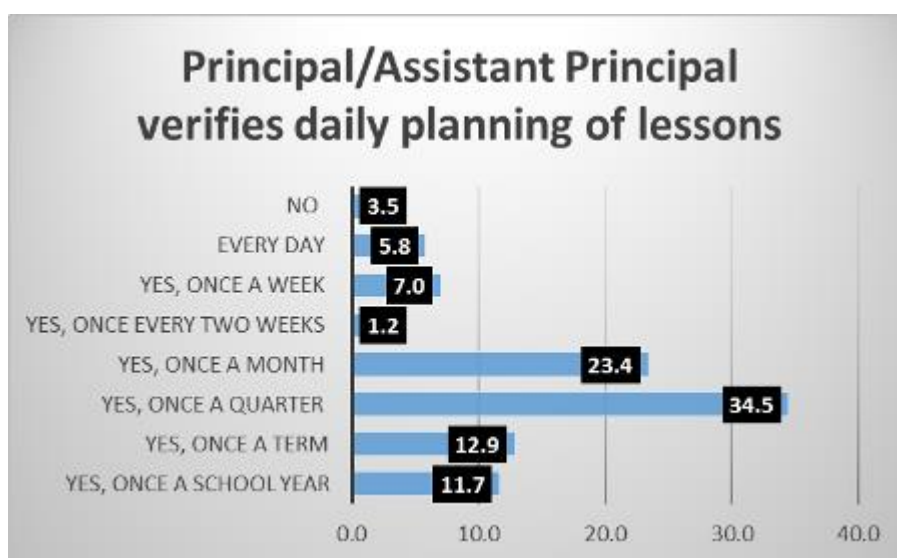
Figure 88: Verification of daily lesson plans of teachers

After the review of daily lesson plans, 86% of the teachers reported receiving feedback and trying to implement the given suggestions in practice. As much as 12% of the teachers said they did not receive the feedback, while 2% said provided feedback was not useful at all.
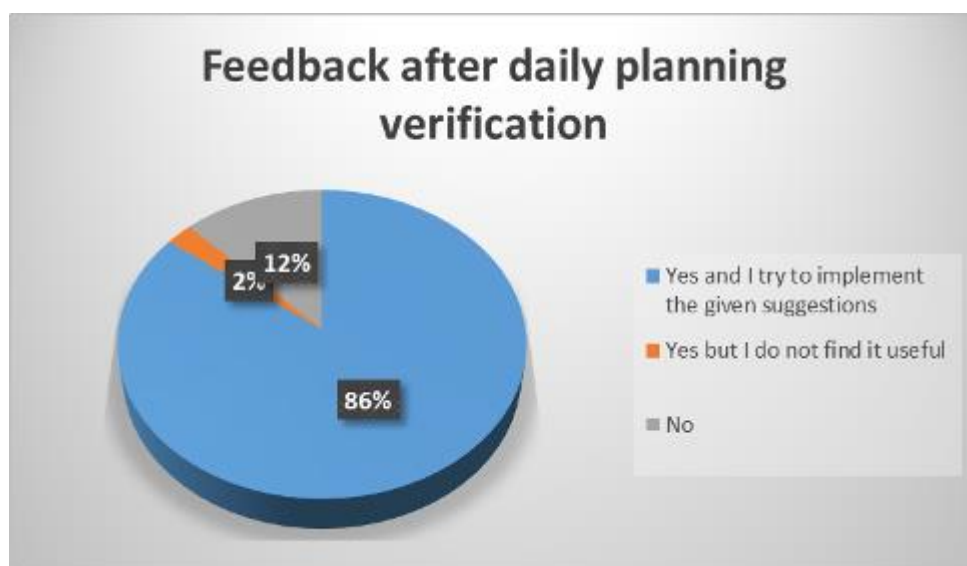
Figure 89: Feedback after verification of daily lesson plans of teachers

The collaboration among teachers regarding the daily planning of lessons is high (96.5%), where majority (36.8%) are doing it so on a monthly basis, while 30.4% on a daily basis.

Figure 90: Teachers' cooperation on daily planning of lessons

The good cooperation is also confirmed when teachers need advice regarding the curriculum. Total of 57% reported that when they need assistance, they discuss the issue with other teachers at their staff meeting or casually (38%). Only 1% said they go to the school director. Thus, while teachers were receiving lesson planning oversight from the school directors on a somewhat regular basis, they were reluctant or did not feel the need to seek assistance about the curriculum from the same source.
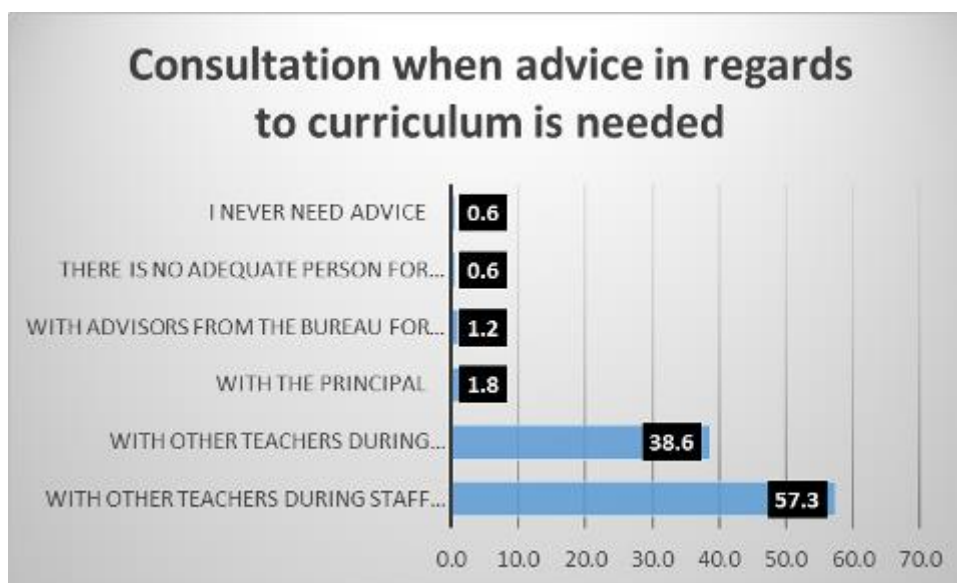
Figure 91: Consultation of teachers regarding curriculum needs

When the teachers were asked about the frequency of visits to the classroom by the student support staff, their responses indicated that such visits were infrequent, with the majority of responses (42%) reporting visits once a quarter or once a term (25%).
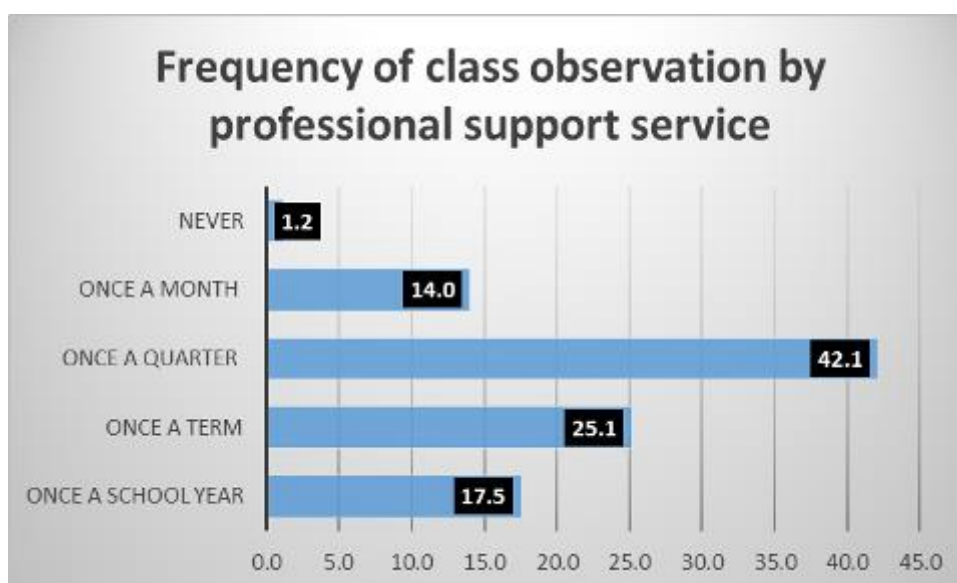
Figure 92: Frequency of class observation by student support service

Assessors also asked teachers about oversight from the BDE in the form of visits from education advisors. Most teachers reported to have been visited once a term, or once a year.
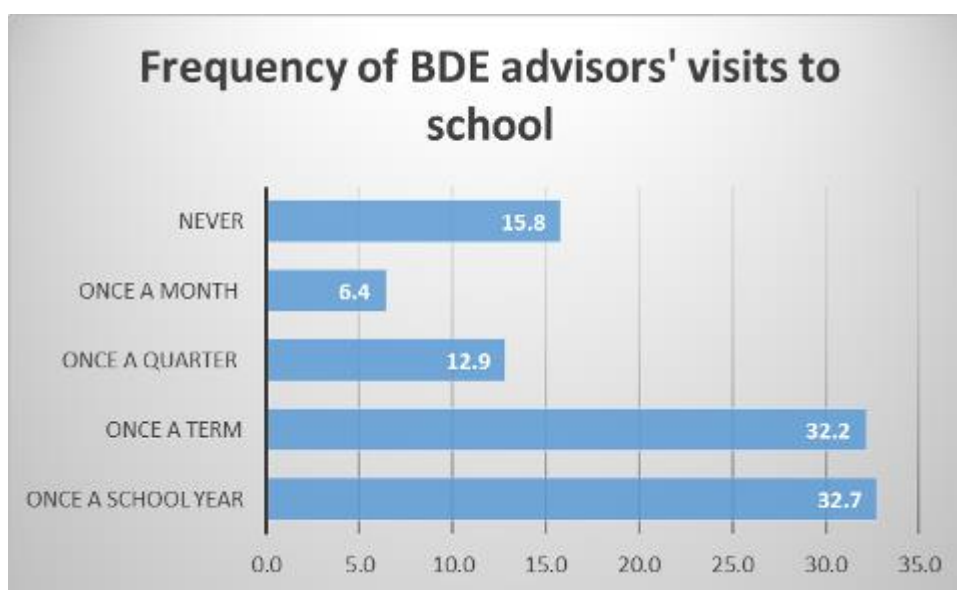
Figure 93: Frequency of school visits by BDE advisors

In terms of monitoring student progress, teachers reported applying a number of direct and indirect approaches to evaluate how students were doing. Approaches included direct observation (15.8%) and questioning of pupils (5.3%), as well as reliance on written assessment results (22.2%), work sheets (2.9%) and mid-term exams (0.6%) and review of student portfolio and other projects (53.2%).
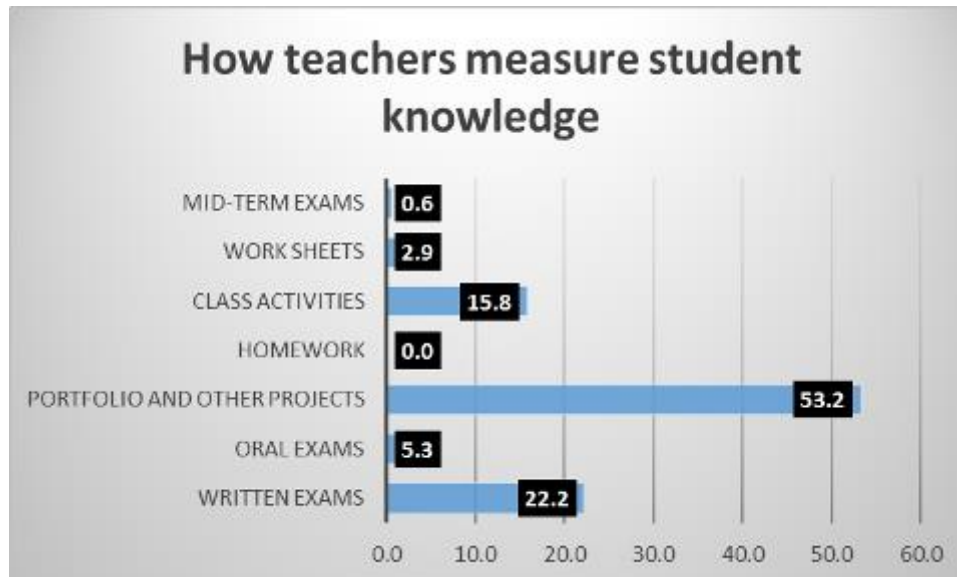
Figure 94: Measuring of student knowledge

When asked how they receive feedback on the performance of their children, most parents (61%) said directly from the teachers, while 20% at the parent's meetings. Few parents, use the new digital sources for getting information on their children's progress, such as text messages (13%) and electronic school registry (6%).

Feedback from the school about child's achievements

- Directly from teachers — 61%
- At parents meetings — 20%
- Via text messages — 13%
- Via electronic school register — 6%
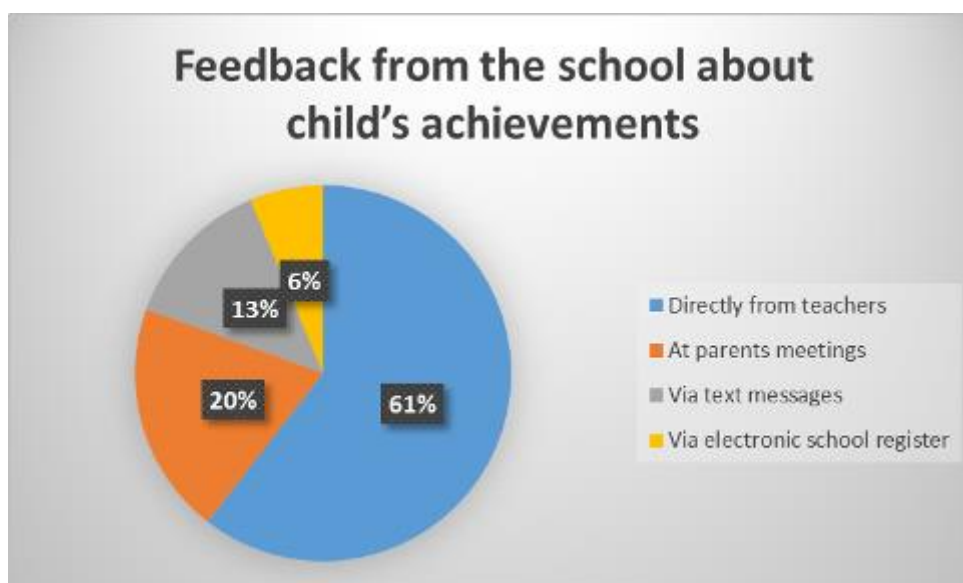
Figure 95: Feedback about student performance

According to the Nine Year Primary Education Framework introduced in Macedonia in 2007, the literacy is being developed in second grade at the end of which it is expected from students to read and write in their native language. Ninety-one percent of school directors agree that this expectation is realistic after the second grade, while 9% still think that students should be literate at the end of first grade.

Grade when is expected from students to read and write in their first language
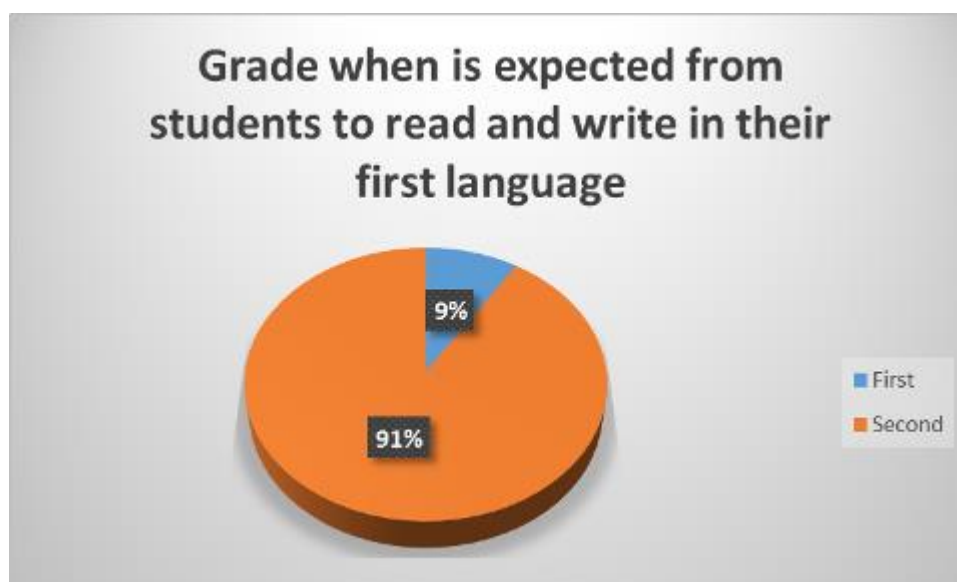
- First — 9%
- Second — 91%

Figure 96: School directors' expectations about student literacy

However, it seems that teachers have higher expectations, as 23% of them think students should be able to read and write in their first language by the end of the first grade.
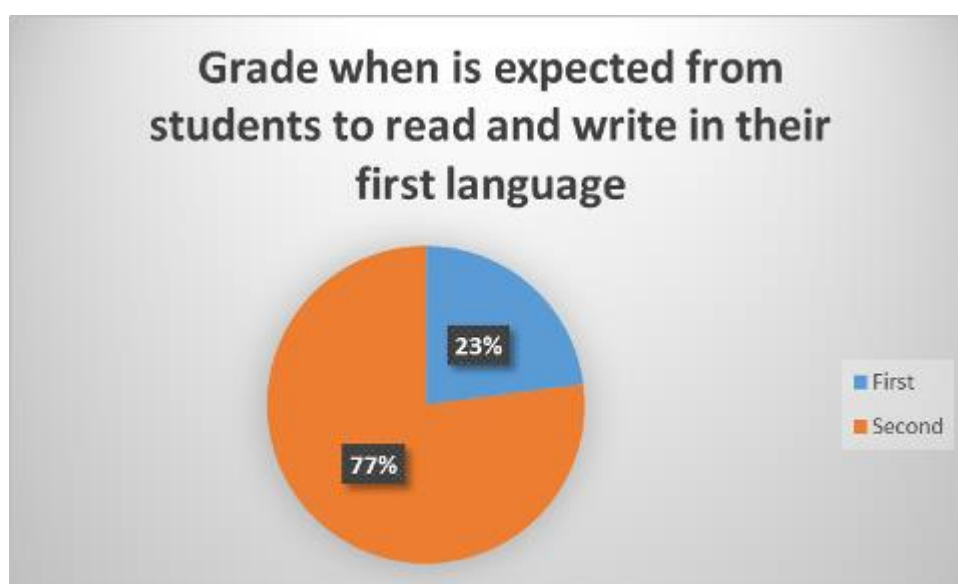
Figure 97: Teachers' expectations about student literacy

Almost all parents (97%) reported their children knew to read, with only 3% answering with no, probably because their children were still in first grade.
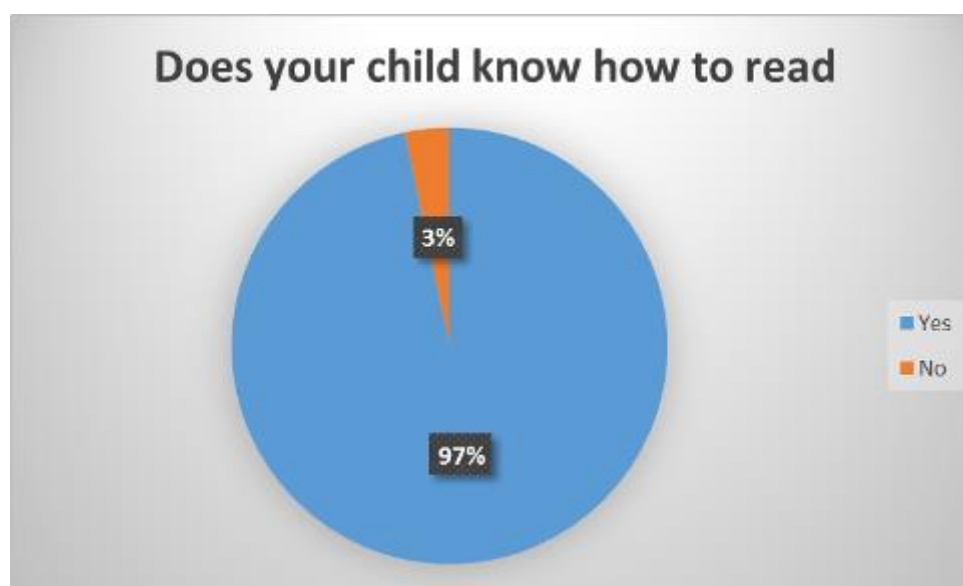
Figure 98: Children's ability to read according to parents

Majority of parents (83.4%) said their children learned to read in school, while 19.2% said the children learned this skill at home with the help of their parents.
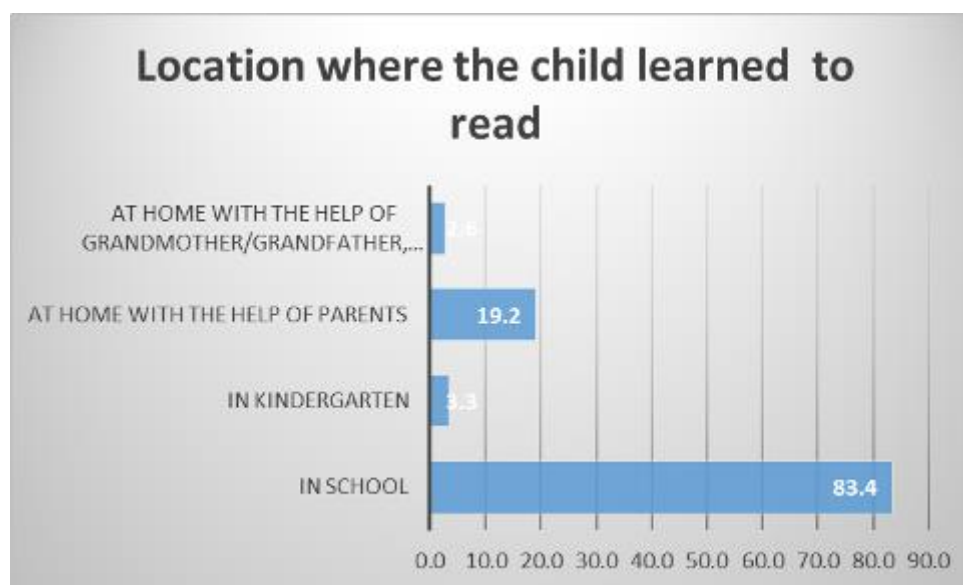
Figure 99: Location where child learned to read according to parents

Summary of results:

- Majority of school directors monitor teacher's performance directly through class observation and check their lesson plans;
- Student support staff observe teachers' classes once a quarter, while BDE advisors visit schools once a term or once a school year;
- Teachers get feedback from school directors on the daily lesson plans and collaborate with other teachers in planning the daily lessons or discussing curriculum issues;
- School directors and BDE advisors are not the main source of advice for teachers for resolving curriculum issues;
- Majority of teachers measures student knowledge through their portfolio and other student projects. None of them uses the homework as an indicator of student performance;
- Parents mostly receive feedback directly from the teachers and seldom from the electronic register or text messages;
- Teachers have higher expectations from students than school directors, as more teachers are expecting from the students to learn to read and write at the end of the first grade;
- Majority of students learned to read in the school setting.

8.5 Parental involvement at schools and at home

Parental involvement is traditionally closely correlated with student success at school. Lacking parental support, poorer students tend to fall behind early and repeat grades or drop out illiterate later in schooling. Parental involvement can include simply encouraging students to attend school on time and to complete their homework. Other parents may review their children's schoolwork, encourage their children to do well, and read to their children or ask their children to practice reading aloud at home. Participation in a Parents' Council (type of parent-teacher association) at the school is another example of parental involvement.

In Macedonia, all schools have a legal requirement to establish Parents Council, and most of the surveyed school directors (94%) were satisfied with the Council's work.

Parents' review of their children's school and homework is also associated with stronger reading performance

Majority of school directors (70%) were satisfied with the level of parents' participation in monitoring the school assignments of their children, but almost one third of school directors (31%) said they were not satisfied.
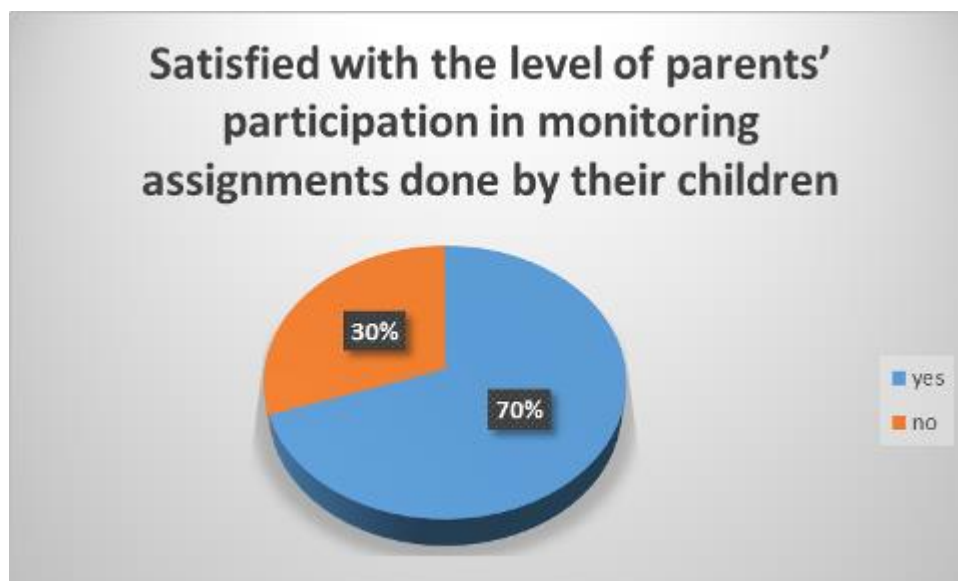
Figure 100: Satisfaction with parents' participation in monitoring student assignments according to school directors

Similarly, two thirds (66%) of the teachers are satisfied with the help parents provide to their children with school assignments. One third or 34% are not satisfied.
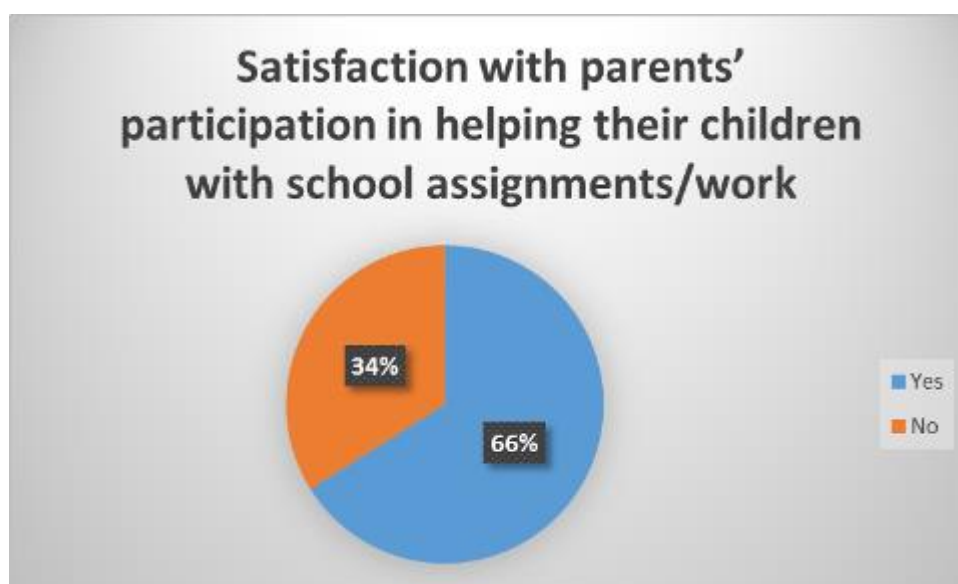
Figure 101: Satisfaction with parents' participation in monitoring student assignments according to teachers

Sixty percent of teachers reported that "many" parents review their child's homework and 26% reported that "few" parents review homework.
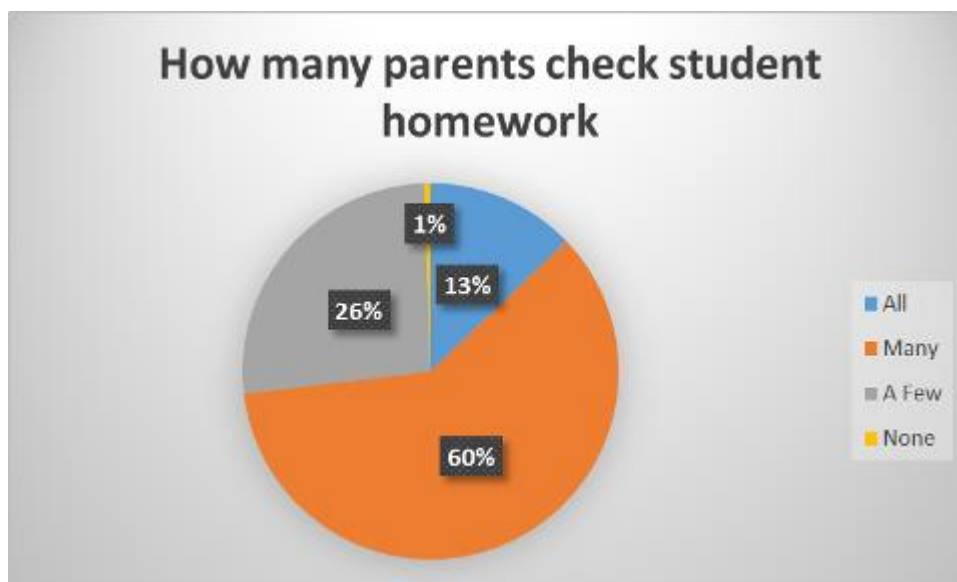
Figure 102: Number of parents checking student homework

From parental point of view, the situation is similar, with 62% helping their children, of which 38% engage in this activity 'always' and 24% 'sometimes'. Additional 30% would help their child if s/he is unable to do the homework alone.
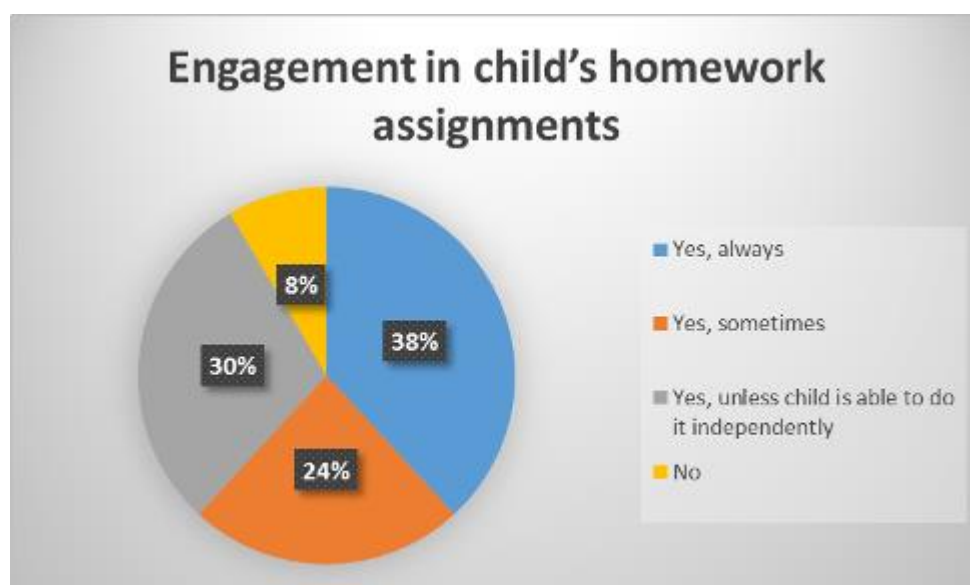
Figure 103: Parents' perception about their engagement in student homework assignments

Access to reading materials outside of school has clear implications for students' reading development, because students who report that they had books (other than textbooks) available at home usually showed greater mastery of letter knowledge, more accurate decoding of invented words and real words in passages, and better comprehension of written and oral passages.
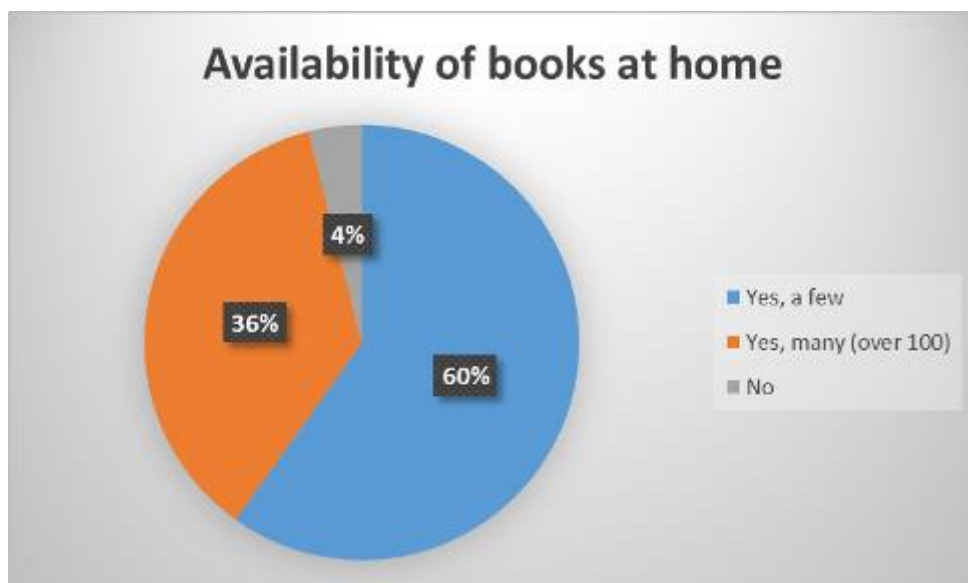
Figure 104: Availability of books at home

However, most (60%) parents said their children had few books to read at home other than textbooks, with only 4% reporting that no books were available at their homes.
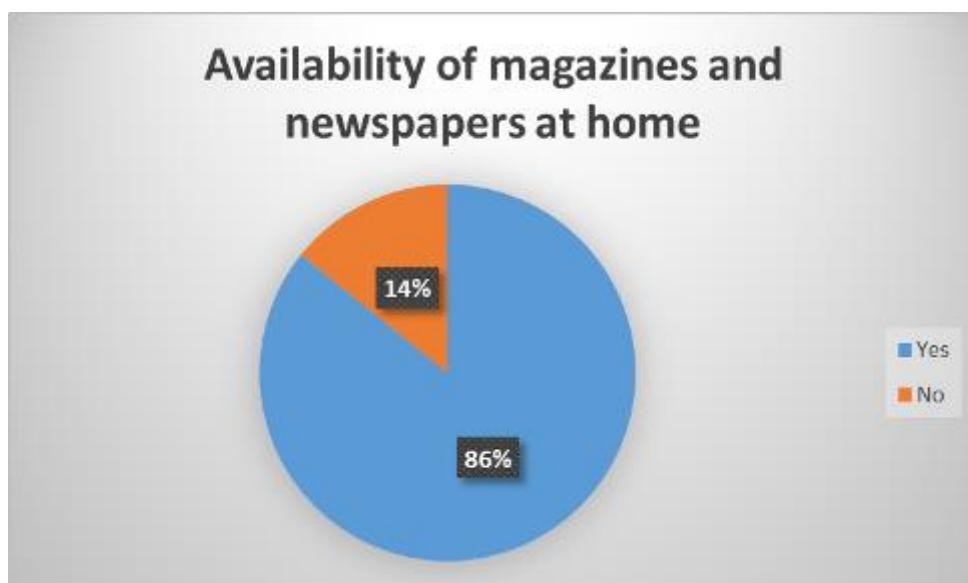
Figure 105: Availability of magazines and newspapers at home

Majority of parents (86%) also reported having magazines and newspapers at home.

Figure 106: Practice of buying books and story books

Most parents (93%) reported that they regularly bought books and story books for their children.

In addition, parents were asked how often they read together with their children at home.
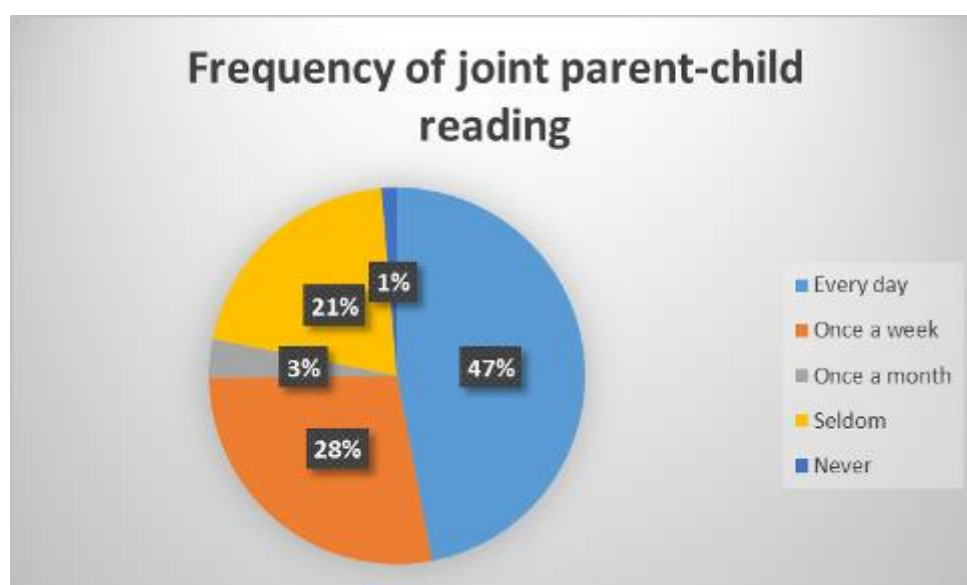
Figure 107: Frequency of parents' reading together with their children

A substantial share of the parents (47%) reported that they read together with their child every day with a slightly smaller share reported reading sometimes (28%). Total of 21% of parents reported they seldom read together with their child.

Almost half of the parents (47%) reported reading story books with their children, followed by 37% who read books from the school's mandatory reading list and 16% books borrowed from the school library.
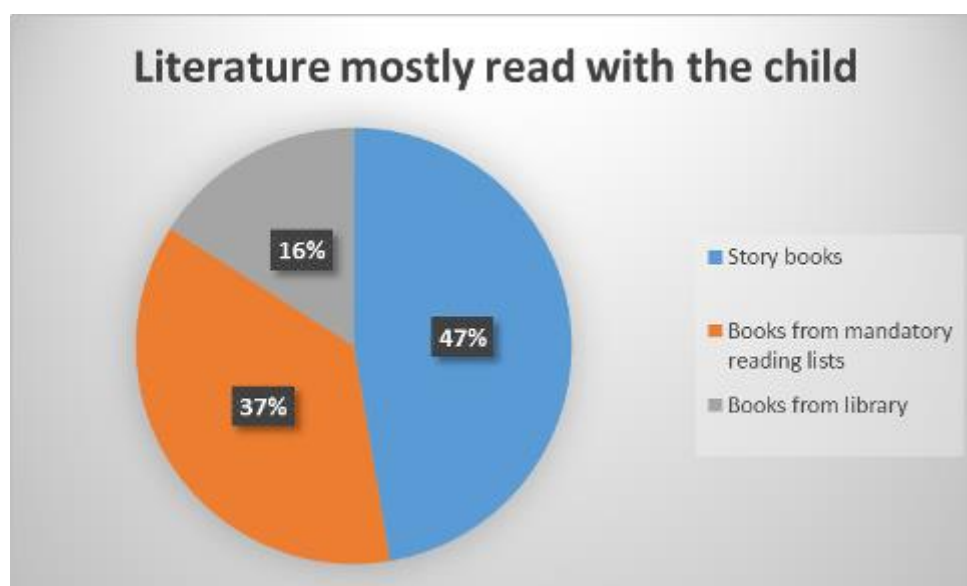
Figure 108: Type of books mostly read by parents with their children

As many as 73.5% of parents said they always discussed the contents of the book with their child after reading it.
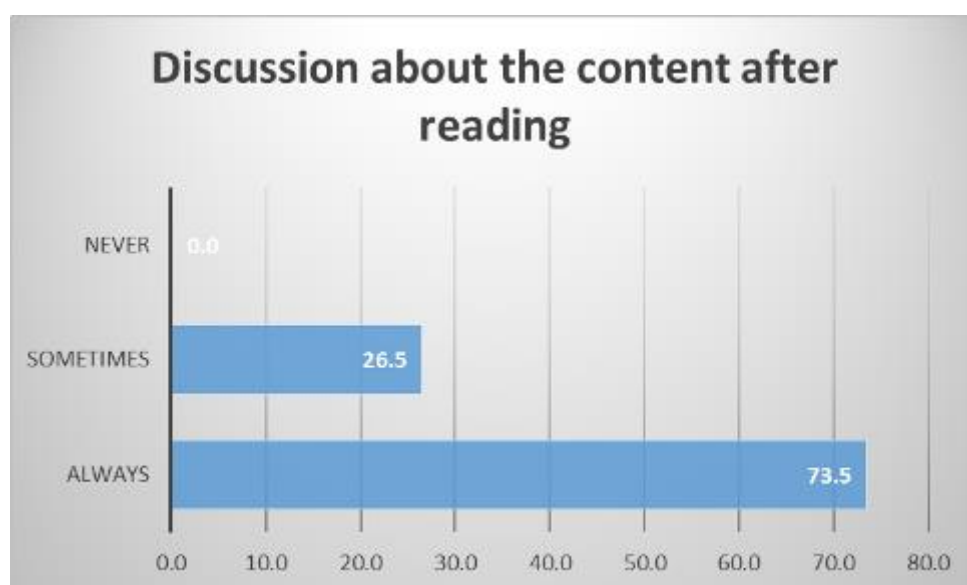
Figure 109: Frequency of after-reading discussion between parents and children

Practicing reading at home is similarly associated with better performance on the reading assessments. When parents were asked how often their children read on their own at home, 80% said they practiced reading every day.
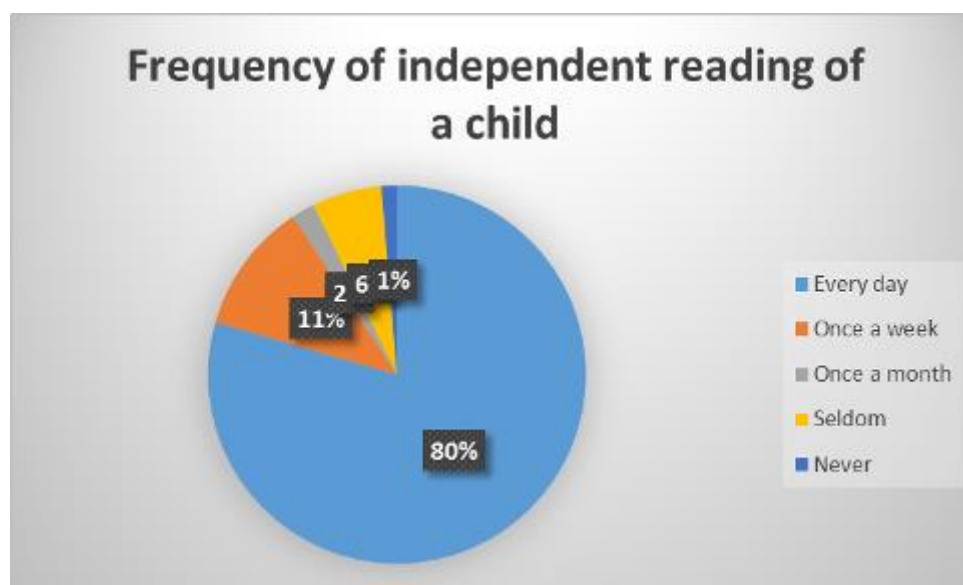
Figure 110: Frequency of children's reading on their own

Similarly as with the joint reading with the parents, most of the students (46%) read story books, 37% read books from the school's mandatory reading list and 17% books borrowed from the school library.
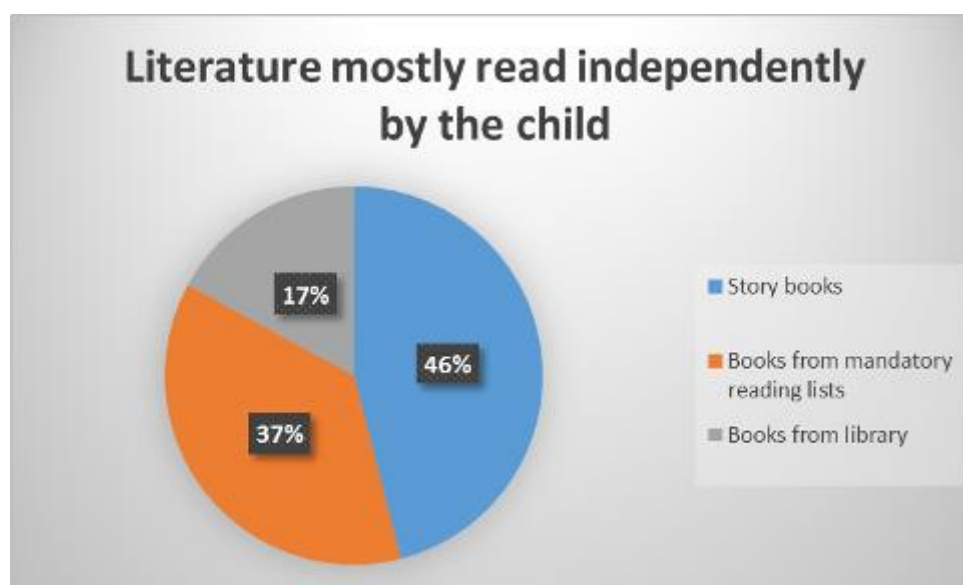
Figure 111: Type of literature mostly read by children on their own

Summary of results:
- Two thirds of school directors and teachers said they are satisfied with involvement of parents in monitoring the assignments of their children;
- More than half of teachers believe that many parents check the homework of their children and similar percentage of parents admit helping their child;
- Most of parents say their homes have few books available for children to read at home, although they report buying story books as regular practice. The situation seems better regarding the availability of newspapers and magazines;

- Most of parents read frequently with their children, but even more parents report their children spending time reading on their own;
- Half of the parents read story books with their children, and 3 in 4 parents discuss the contents of the read materials.

9. IMPLICATIONS OF EGRA/ EGMA AND BASELINE RESULTS

9.1 Lessons Learned from EGRA AND EGMA application

EGRA results from the baseline study conducted in Macedonia show that the basic reading skills of Grade 2 and 3 students are not as poor as in some other developing countries where these tools were applied (see Table 22), but they still need improvement in order to get closer to the international average standards (Table 24).

Table 22. Comparison of average EGRA scores in reading fluency from Grade 1-4 in different developing countries

Reading Fluency (correct words per minute)	Ghana (best score of 11 Ghanaian languages)	Kenya (in Kiswahili)	Iraq (Modern Standard Arabic)	Zambia (Bemba language)	EGRA Macedonian language	EGRA Albanian language
Grade 1						
Grade 2	19.8 (8.1)*	19.6 (10.2)	17.3 (11.4)	13.77 (1.3)	41	40
Grade 3			25.5 (21.2)	20.73 (4.5)	72	65
Grade 4	18.6 (9.2)**				72	65

* numbers in brackets present the average results including the zero scores (children unable to read a single word)
** results in English language

EGRA results in Macedonia suggest that students are taught how to name letters correctly, which is a good basis for acquiring reading skills as international evidence shows that letter naming is a good precursor of other skills. However, according to EGRA results, such high performance in letter recognition and naming does not necessarily translate into good levels of reading fluency for the same language, as automaticity in reading familiar words and short stories is not acquired yet, particularly in Grade 2.

The ability of a student to read text effortlessly, quickly, accurately, and with expression is essential in becoming a competent reader and understanding the read content. Research has consistently demonstrated a strong relationship between reading fluency and reading comprehension. International research has shown that a reading speed of between 45 and 60 words per minute is considered the minimum required to ensure reading comprehension[9] and this range is used by different stakeholders as a benchmark. For instance, EGRA scores suggest Grade 2 students in Macedonia are reading too slowly, of around 30 correct words per minute (in unconnected text), so they do not understand everything of what is read. The fluency increases in reading a short story to around 40 cwpm, but students are still not reading fast enough to be able to understand the text and respond to comprehension

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[9] Jan Hasbrouck and Gerald A. Tindal. (2006, April). Oral reading fluency norms: A valuable assessment tool for reading teachers," *The Reading Teacher, 59*(7): 636–644. doi:10.1598/RT.59.7.3.

questions (which is reflected in poor performance on this task as they answer the questions with 45% accuracy). The same conclusions apply for Grade 3 students, where the international standard is 90 cwpm and the results in our country range from 65 cwpm in Albanian to 72 cwpm in Macedonian language (see Table 24).

The best results students achieve when they have to give answer to literal questions or name facts evident from the text. As soon as they have to give their own opinion, interpretation of facts or judgment, the results deteriorate. That is why the children should be exposed to such questions from an early age, as all international assessments, in which Macedonia is not highly ranked, seem to require answers to inferential questions.

The data collected with the baseline study may and should be used for opening a policy dialogue in order to inform education stakeholders of the current status of students' reading performance and to raise awareness about the importance of reading in the early grades for all future learning. EGRA performance data should be used to establish national reading performance measures.

Overall, reading rate as correct words per minute proved to be a valid and reliable indicator of achievement. Established norms or benchmarks from Grade 1 through 3 are used to compare fluency scores for screening students to determine if an individual student may need targeted reading assistance, and monitoring students' reading progress. Some examples of international benchmark assessments include US Oral Reading Fluency Norms and Dynamic Indicators of Basic Early Literacy Skills (DIBELS). A number of countries have already developed own norms (for English, Spanish, and Italian language) and in countries where detailed norms have not been developed, reference is made to the U.S. norms. Norms are simple numerical benchmarks which may guide teachers to focus on attainable goals. Examples of different reading fluency norms based on correct words per minute are provided in Table 23.

Table 23. Various reading fluency norms based on correct words per minute

US Oral reading fluency norms[10]	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	
Grade 1	15	28	53	82	111	
Grade 2	31	61	89	117	142	
Grade 3	48	78	107	137	162	

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[10] One widely used curriculum-based measurement (CBM) procedure is the assessment of oral reading fluency (ORF), which focuses on two of the three components of fluency: rate and accuracy. A teacher listens to a student read aloud from an unpracticed passage for one minute. At the end of the minute each error is subtracted from the total number of words read to calculate the score of correct words per minute (cwpm). CWPM has been shown, in both theoretical and empirical research, to serve as an accurate and powerful indicator of overall reading competence, especially in its strong correlation with comprehension. The results of an extensive study of oral reading fluency by Jan Hasbrouck and Gerald Tindal (published in The Reading Teacher in 2006) provide scores for students in grades 1–8 for three different time periods across a school year. For each grade level, scores are presented for five different percentile rankings: 90th, 75th, 50th, 25th, and 10th. For the purposes of comparison with EGRA results in Macedonia, Table 23 presents the results for students in Grades 1-3 for the spring assessment (which is equal to the time period when our study was conducted).

DIBELS[11]	Benchmark goal[12] (words correct)	Cut point for risk[13] (words correct)	Benchmark goal (accuracy)	Cut point for risk (accuracy)		
Grade 1	47	32	90%	82%		
Grade 2	87	65	97%	93%		
Grade 3	100	80	97%	94%		
Reading guidelines in Chile	Very fast reader	Fast reader	High average	Low average	Slow reader	Very slow reader
Grade 1	56	47-55	38-46	29-37	22-28	21
Grade 2	84	74-83	64-73	54-63	43-53	42
Grade 3	112	100-111	88-99	76-87	64-75	63

* the numbers in red present the average values

The 50th percentile may be used as a reasonable gauge of proficiency for students, having in mind that it is appropriate and expected for students to adjust their rate when reading text of varying difficulty and for varied purposes. If a student's correct words per minute (cwpm) score is within plus or minus 10 cwpm of the 50th percentile on the Oral Reading Fluency table, or is more than 10 cwpm above the 50th percentile, the student should be considered as making adequate progress in reading. Students scoring 10 or more words below the 50th percentile need a fluency building program.

Table 24. Comparison of student average scores (cwpm) from Grade 1-3 on different reading tests

	US Oral reading fluency norms	DIBELS	Reading guidelines in Chile	EGRA Macedonian language	EGRA Albanian language
Grade 1	53	47	37		
Grade 2	89	87	63	41	40
Grade 3	107	100	87	72	65

Table 24 compares the average scores of students tested with EGRA in Macedonian and Albanian language with the average scores of two internationally accepted benchmarks and a developing country. According to curriculum expectations, Grade 2 level in Macedonia corresponds with Grade 1 level in US and Chile, because this is the grade when students

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[11] The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are a set of procedures and measures for assessing the acquisition of early literacy skills from kindergarten through sixth grade. They are designed to be short (one minute) fluency measures used to regularly monitor the development of early literacy and early reading skills. DIBELS are comprised of seven measures to function as indicators of phonemic awareness, alphabetic principle, accuracy and fluency with connected text, reading comprehension, and vocabulary. DIBELS were designed for use in identifying children experiencing difficulty in acquisition of basic early literacy skills in order to provide support early and prevent the occurrence of later reading difficulties.

[12] Benchmark Goal: Students scoring at or above the benchmark goal have the odds in their favor (approximately 80%–90%) of achieving later importing reading outcomes. These scores are identified as At or Above Benchmark and the students are likely to need Core Support.

[13] Cut Point For Risk: Students scoring below the cut point for risk are unlikely (approximately 10%–20%) to achieve subsequent goals without receiving additional, targeted instructional support. These scores are identified as Well Below Benchmark and the students are likely to need Intensive Support.

acquire basic literacy skills. Accordingly, Grade 3 students in Macedonia should be compared with Grade 2 students, internationally.

The average scores suggest that students in Macedonia reading 40 cwpm are transitioning from word-by-word identification to increased fluency. They scored less than 80% overall on the reading comprehension subtask, which means they do not have sufficient fluency (automatic and accurate word identification) to focus on comprehension[14].

As internationally acceptable goal for word recognition performance in developing countries is set at the level of 60 correct words per minute (cwpm) at the end of Grade 2[15], in the policy dialogue, education stakeholders should discuss this goal and agree whether it should remain at 60 cwpm or may be lowered to 45 for the Macedonian context. Up-to-date national oral reading fluency norms based on relevant research can serve as an important tool to assist educators in developing, implementing, and evaluating effective instructional programs to help every student become a skilled, lifelong reader and learner.

Once the reading norms are established, teachers can easily monitor the reading levels of their students. Those whose reading performance is at or exceeds the level expected for their grade placement may need only to have their reading progress monitored a few times per year to determine if they are meeting the benchmark standards that serve as predictors of reading success or can be used in class to help the struggling readers.

For students reading six months to one year below their grade level, supplemental support should be provided to improve their reading skills. For these students, progress-monitoring assessments may be administered more frequently, perhaps once or twice monthly or as often as once per week. Intensive support might entail:
   • delivering instruction in a smaller group,
   • providing more instructional time or more practice,
   • presenting smaller skill steps in the instructional hierarchy,
   • providing more explicit modeling and instruction, and/or
   • providing greater scaffolding and practice.

The EGRA baseline results highlight some critically important areas in which interventions will be needed. In almost all tasks urban students outperformed rural students, which could be a red signal for education policy makers. Poor instruction process, weak supervision from the education institutions, lower level of education of parents, little exposure to books and other reading materials, limited support from the community at large could be some of the factors contributing to these results. Any reading intervention should also target the students with Albanian language of instruction, male students, students from satellite schools, students that have not attended pre-school and children of parents with primary or less than primary education.

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[14] Ghana 2013 EGRA/EGMA Findings Report defines the following categories:
Cannot read: oral reading fluency (ORF) score is zero
Read some words, but not understand: ORF score is greater than zero and reading comprehension score is below 60% correct of those attempted
Read with some understanding: reading comprehension score is 60% of those attempted
Read fluently and understand: reading comprehension score is 80% correct of total

[15] See Abadzi, H, L. Crouch, M. Echegaray, C. Pasco, and J. Sampe, "Monitoring Basic Skills Acquisition through Rapid Learning Assessments: A Case Study from Perú," **Prospects**, Issue 134, 35(2), June 2005.

Even for the results in mathematics it can be difficult to be compared across countries as curricula are different and one needs to be sensitive to these differences as well as to the country- and culture-specific issues. Having in mind that new curriculum in mathematics and sciences will be introduced in Macedonia starting from September 2014, the subtasks in the EGMA instrument for the follow-up studies should be revised to reflect the changes and adjusted to the new curriculum objectives. As a result of this, it would be difficult to compare the baseline results with those from the follow-up studies.

The recommendations provided below are informed by both EGMA results in the Macedonian context, but also by international good practice in teaching mathematics.

Although number identification seems that this subtask is way too easy even for Grade 2 students, it is recommended to keep it as part of the instrument, because it is the first assignment the students get. The easy task can make them feel more confident and competent to do the math test. A further modification may be made to this task, such as the increase in the number of items and perhaps the level of difficulty of items.

As the average percentage of students that perform number discrimination task is high, the inclusion of more difficult items may more accurately measure this ability. Measuring the speed of number discrimination may reveal subtle yet important differences in numerical information processing that one may not be able to get at by assessing accuracy alone. Given the increase of difficulty in items and the goal of having students demonstrate some level of efficiency with this task, it may be timed for 60 seconds in the follow-up study.

Students in each of the grades tested had difficulty with the missing numbers task. It appears that they receive little instruction in school in recognizing or counting in patterns. This could make it difficult for them to master multiplication and other, more complex, problem-solving later on. Mathematics involves among other things the study of patterns. This includes recognizing, describing, extending, and eventually generalizing patterns. It is critical that learners are provided with opportunities to develop these skills. Students in Macedonia need substantial exposure to counting in steps other than 1, as they were struggling with more complex patterns, such as a count-by-two, three or five.. Counting in steps is critical if children are to be able to decompose and recompose numbers—critical to working flexibly with numbers. Based on the information collected, this task may be reformatted with an even distribution of 10 items that progress in difficulty.

The ability to perform basic calculations (addition and subtraction) confidently and fluently is a foundational skill in mathematics. Students performed worst on the subtraction task, which is understandable, as subtraction is a more difficult process than addition in the early stages of learning. The poor results in addition and subtraction may suggest that students in Macedonia are not doing enough calculating with numbers.

To learn of children's fluency and strategy use, in some countries where EGMA was implemented (Kenya, Malawi) the addition and subtraction sections were broken down into two parts, level 1 and level 2. Level 1 assess for fluency i.e. whether children are becoming familiar with simple addition/subtraction problems, with a total of 10 items to be timed for 60 seconds. Children will be instructed to tell the assessor the first answer that seems right to them. Counting on fingers will be discouraged as assessors will prompt the children to tell them the first answer that seems right. The time and number correct will be recorded. As soon as level 1 is complete, the assessor will move on to level 2. The items used in level two are an even distribution of 10 grade-appropriate addition/subtraction problems. Level 2 is timed for 2 minutes, however the timing is not for fluency, but for efficiency. Here, children will are given the opportunity to use counters or their fingers to solve the addition/subtraction

problems. Children will be stopped from continuing if they get three consecutive errors or if they run out of time (lapse of 2 minutes). Assessors are to enter the number correct, and if the children use their fingers or the counters when solving the problems.

Problem solving is the fundamental purpose of mathematics. Student underperformance on the word problems subtest tells us a lot about how they experience mathematics. Rather than experiencing mathematics as a meaningful, sense-making, problem-solving activity they experience it as the memorization of facts, rules, formulas and procedures needed to determine the answers to questions. Unfortunately, this experience of mathematics contributes to very limited and hence limiting understanding of the subject and, in turn, underperformance. For future EGMA applications, the number values in the word problems may be small because with this subtest we are not testing the student ability to solve the arithmetic as much as we are testing their ability to make sense of/interpret a problem statement.

During EGMA assessment students were provided with counters (manipulatives) as well as paper and pencil, which they were allowed to use to solve the addition, subtraction and word problems. It was made clear to the learners that they were allowed to use these tools but that they did not have to. The test administrators were asked to record whether or not the learners used their fingers, the counters, and/or the paper and pencil. However, the apparent reluctance of students to use any of the tools available (including their fingers) may indicate, firstly, that these students are not used to solving problems with the use of manipulatives and, secondly, that they experience mathematics as the production of answers, often from memory. The subsequent training should instruct teachers to effectively use counters (or other props and visual aids) even fingers in the classroom, as learning mathematics in this way is more appropriate for students at this stage of cognitive development.

When pupils have not gained procedural fluency on simple addition and subtraction problems, they will be likely to use inefficient strategies and will have increasing difficulty as numbers get larger and operations get more complicated. More practice with missing numbers, addition and subtraction with and without regrouping, multiplication and division and word problems with real life contexts should be encouraged in early grades.

In the shape recognition task, the recommendation of the assessors themselves was to refrain from using irregular or unknown shapes as students found them difficult or confusing. A stop rule may be modified as well allowing students to attempt each shape sheet, but to stop from continuing to identify shapes on a shape sheet if and when the student identifies an incorrect shape.

For pattern extension, a stop rule may be also applied to allow no more than 30 seconds on a pattern.

The implication for any future EGRA/EGMA application should take into consideration the following:

- To instruct assessors to refrain from trying to *teach* the children the task.
- Assessors should practice using counters at the training on administration of EGRA and EGMA.
- Training should include not only simulation between participants, but also actual practice with grade-appropriate students.
- Observers to get score cards when observing the assessors, which will be later used for certification. Each mistake will be scored with one point, where a score of 10

points or more will be considered a failure, while anything less than 10 points will merit certification.

The results of the EGRA/EGMA already indicate a need to review national policies and their implementation related to early grade language and mathematics. These include the design of the curriculum for early grade literacy; a restructuring of the school timetable to increase time for reading; a priority on providing appropriate and sufficient instructional and reading materials; teacher training to include using EGRA/EGMA tools for mastery checks in the classroom, working with students with dyslexia, organizing reading corner in the classroom and providing time for children to read aloud; and increased community and parental engagement to support early grade reading and mathematics.

9.2 Availability of learning materials and equipment in early grade classrooms

It is necessary to provide more learning resources for early grade students. This is especially important for Albanian-speaking students, as they lack reading materials in their native language. Materials should be also provided to rural schools, as the students in these schools are disadvantaged because of the lack of reading resources available to them. The overall EGRA results confirmed that both Macedonian and Albanian students that have books at home performed better than those that did not report having books at home.

Reading materials should be also provided for the school libraries. Library initiative is necessary to attract the students so they can take the story books for reading at home.

More support should be provided especially to rural schools in terms of making their classroom more student friendly and creating an effective learning environment for the students. Teachers also need support in organizing the classroom into various activity centers, where children will be really engaged in suitable activities based on their interests and where group work will be promoted. The activity centers should not serve only as points where student works are exhibited and presented, but also as corners where the actual work is done. The use of classmate computers, which are portable, is also helpful in doing this.

The digital resources used in the classroom should be updated and enriched with new content suitable for early grade reading, writing and mathematics, both for individual and group work.

In the schools with limited classroom space or large number of student working in shifts it is recommended the teachers and students from early and higher grades that share the same classroom to meet regularly and decide on the decoration of the classroom. Part of the wall space should be for the materials of early grade students and the other part for higher grade students. Another proposed solution for the shared classroom is to introduce mixed shifts, where students from early and higher grades go in the same shift (first, second, third, sixth and seventh grade in one shift, while fourth, fifth, eighth and ninth grade in another) making it possible for students from early grades to share the same classroom.

The after-class activities organized for promoting reading and mathematics should be organized in a way, where students can learn from and help each other, and more support can be provided to students with poor results or learning disabilities. The students can be involved in creative not just in competitive projects.

Poor students with language delays may benefit from longer instructional days when extra-curricular activities are used well. Cognitive research predict that students elaborating

concepts for a longer period would remember it better than students covering more concepts for shorter periods. Thus it is important to use the classroom time effectively through introducing more interactive instructional methods and feedback that enable students to contemplate, analyze or synthesize the subject matter which might increase student achievement.

As quality learning environments inside and outside of schools help all readers grow their reading skills, it would be beneficial to create a parental and community program that would guide parents and communities to support children as they learn to read and foster their love of reading. School committees, parents' councils, community members, nongovernmental organizations, and the private sector should come together to contribute to building a strong base of supplementary reading materials for students to use at school and at home for independent reading and practice in all local languages. Establishing 'classroom book boxes' is an example of what could be done.

The school libraries should be also more open for early grade students and some of the learning activities may be realized in the larger libraries to accustom the students with the practice of borrowing and returning the books in the library.

9.3 Teachers' training needs assessment

Over the years, various opportunities for professional development were provided for teachers through different projects funded by the national government and international donors. Although at different times of the school year teachers seem to be overburdened with training sessions, workshops and other activities taking their time away from the classroom, they still identify their weakness and needs for further training. This is especially true for the teacher beginners or the newly hired pedagogues and psychologists, who feel they are not ready and equipped with all the necessary skills required by the teaching process.

It is recommended the training activities to be focused on some of the topics pointed out by teachers as important and useful. By tailoring the training activities according to the personal needs of teachers they will be more effective and their personal and professional involvement will be ensured.

Teachers should be trained on how to incorporate engaging skill-building activities and more dialogic reading into their regularly scheduled curricula. By focusing on the core reading and mathematics areas throughout lesson planning and implementation, teachers would be able to ensure that children build a solid foundation for literacy. Teachers could also be trained in conducting ongoing assessments of student progress, once the Tangerine: Class application is available, to serve as a guide for their instruction.

All training activities in the area of mathematics should be fully aligned with the new math curriculum to be introduced with the start of the new school year 2014/15. The new math curriculum was developed by the Bureau for Development of Education in cooperation with the Cambridge Examinations Center and training workshops for early grade schools from all primary schools in Macedonia were delivered until the start of 2014/15 school year. EGMA results suggest that professional development is needed in specific instructional strategies and methods focused on mathematics (both pre and in-service training on numeracy instruction) focusing attention on how children are getting the basics, and develop conceptual understanding, adaptive reasoning, and strategic competence (e.g., frequent or daily opportunities to count concrete objects with counters). Teacher training and development

needs to pay attention to pattern recognition, and extension as well as increasing and decreasing sequences (critical for missing number subtask). Such an approach would support the acquisition of foundational mathematics and reading skills, with an emphasis on students' conceptual understanding, which is in line with teacher training needs.

The training and networking activities between teachers and schools remain to be important tool for professional development of teachers and they should be addressed appropriately in Component 2: Professional Development and Component 3: Learning Communities.

9.4 School practices

Further information is needed about the reasons for absence of teachers and particularly students from the regular classes.

International research suggests that absences of teachers are mainly result of teacher participation in educational workshops, in-service training sometimes lasting for several weeks, personal problems, and pregnancy of female teachers.

Some international practices for reducing absenteeism include: salary deduction of the hours absent, assigning teachers to schools near their homes, help for new teachers, regular and effective monitoring and establishing disciplinary committee in the enforcement of teachers' code of conduct.

Aside from appointing substitutes when needed, it is recommended for the schools provisions to be made to keep students occupied during periods of teachers' in-service training that is usually conducted during school hours.

Teachers often complain that curriculum is overloaded, so even modest time wastage may result in significant student losses. To make up for absenteeism, teachers may just lecture in a hurry rather than analyze the content and use the teaching aids provided to schools, or they may omit parts of the curricula.

Furthermore, even when teachers and students are present in class, they still may be engaged in activities other than teaching, learning and interaction, so the challenge is to maximize time students spend on task. This is also closely related with pedagogic oversight and is discussed more in the next chapter, because one outcome of limited instruction is an inability to read fluently (if at all) until the later primary grades.

As the school-level sources of time loss reported are near zero, it is strongly recommended in the subsequent studies and class observations to explore how classroom time is used.

9.5 Pedagogic oversight

Ideally, students should be engaged in learning during the entire time they are in class, but this is often not the case. In reality, it is impossible to use 100% in instruction, as children and teachers will interact socially some of the time. Students who learn the prescribed curriculum are most likely to score well in achievement tests, so academic learning time may be a more useful predictor of learning outcomes than mere engagement in learning activities. Instructional time was found in many international research to be one of three major areas (in addition to teacher quality and textbook availability) in which consistent achievement effects were obtained.

Measuring the time spent teaching the relevant curricula may be advantageous for Macedonia, as there is little systematic information regarding the amount of time teachers actually spend presenting new material and progressing with the specified curriculum. The classroom activities are mainly classified as interactive (instruction, discussion, questions), passive (copying and seatwork), and management (various activities peripheral to instruction). How the time is divided among these activities may help teachers to use time well in class and the feedback may be used for fine-tuning.

Losses in instructional time can be limited with some reasonably effective administrative mechanisms that regulate school time and monitor teacher compliance:

- teachers curricular calendars help them easily visualize where they should be and prevent classes from falling behind;
- time on task in class should constitute evidence of effective supervision by school directors, inspectors, or BDE supervisors;
- making school management (director, assistant director) explicitly accountable for monitoring teachers' presence, tardiness and classroom instructional time;
- establishing accountability with BDE staff who interface with teachers to monitor time use at the local and central levels;
- specifically training teachers to use time well, particularly through dissemination of effective classroom management practices that can keep students occupied all the time;
- training principals and supervisors to recognize the major components of instructional time use with brief observations and to use this system in their work;
- Principals may guide teachers to maximize interactive instruction and minimize organizational activities in order to maintain student attention and minimize time off-task.

International recommendation is for instructional time to be reallocated towards basic skills (reading, language and math), reducing many of the less important courses and requirements that fill curricula[16] in many countries.

Education institutions need to establish systems for regular school, teacher and student performance monitoring, tied to clear performance targets. Data from such monitoring systems should be used to inform interventions for improving student learning outcomes. School management should work together with education institutions to ensure that sufficient supervision or coaching is available to assist teachers as they learn and apply new and effective teaching methods. To this end, training on effective coaching for supervisors (inspectors, BDE advisors, school director, student support services) is needed.

9.6 Parental involvement at schools and at home

Parental involvement in their children's learning is associated with better student performance on several levels. It is therefore important that parents and local community members are aware of the significant contribution they can make to their children's learning by providing a stimulating environment around language, reading and writing, and mathematics as well as supporting at home the school's literacy agenda during the early years of schooling.

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[16] See Abadzi, H, "Instructional Time Loss and Consequences," The World Bank, Independent Evaluation Group, October 2007.

Although most schools have a library and students have access to them, they should be encouraged together with their parents to visit the school, but also the city library (if any available), get appropriate books and do the reading at home. Aside from joint reading with parents and silent reading, children should be also encouraged to read to their parents so they can monitor the progress at home and adjust the pace and frequency of reading as well as the reading materials.

Reading practice at home is another important factor that contributes for children becoming stronger readers. Involvement with reading activities at home has significant positive influences not only on reading achievement, language comprehension and expressive language skills but also on pupils' interest in reading, attitudes towards reading and attentiveness in the classroom.

Provision through various media also needs to be made to help guide parents to provide a literacy-rich and stimulating environment. Since not all parents realize the importance of their role in supporting their children's literacy, or have the resources or capabilities to do so, it is important appropriate support to be offered for them. A potential outcome measure that is easily understood by the wider community is for instance that all students should become fluent readers by the end of grade 3. These characteristics can be taught through videos that contrast acceptable and unacceptable features and examples of children who can read fluently. Parents and other community members (even in villages and those who are illiterate) can perceive and monitor reading fluency, because it resembles human speech. Similarly, simple goals may be established for math.

During the summer period, some children may suffer a drop in reading ability and return to school in September at a disadvantage. The project, with partner institutions, libraries and schools may organize the Summer Reading Challenge by borrowing books from the library, to encourage early grade students to keep reading over the summer holidays, increase their reading range and their enjoyment of reading and prevent the loss of learning. Every time a child finishes a book they may get stickers and rewards or a certificate for everyone that finishes. Each year the Challenge can focus on a new theme to add fun and creativity into reading.

Finally, a National or Family Reading Campaign may promote reading for pleasure throughout the whole community to demonstrate the varied ways in which reading can inspire and sustain people to develop their skills, with a focus on those most in need. The importance of encouraging reading in the home, public storytelling, shared reading should be integrated into the planning and activity of all the key organizations concerned with education and libraries. The Magic Literacy Van can be a great resource center for such campaign in the local communities.

10.   ANNEXES

10.1   Annex 1: School Director/ Assistant School Director Questionnaire

1. What is your work position in the school?

- o   Principal

- o   Assistant Principal

2. Gender

- o   Male

- o   Female

3. Do students attend classes in shifts?

- o   Yes

- o   No

4. How many early grade school teachers does the school have?

- o   Up to 5

- o   5-10

- o   11-20

- o   Over 20

5. How often are teachers absent from work (excluding absence due to training)?

- o   Seldom (up to 5 days a year)

- o   Often (up to 10 days a year)

- o   Very often (over 10 days a year)

6. Are teachers late for class?

- o   Yes, most of them are

- o   Only a few are

    o No, none of them is

7. What alternatives do you have for students in the absence of their teacher?

    o Teacher from another class is appointed in charge of the class

    o Appropriate substitute (psychologist/pedagogue/sociologist) is in charge of the class

    o All students join another class

    o Students are transferred in other classes

    o Students spend school hours in the school playground

    o Classes are dismissed and children can go home

8. How do you follow teachers' performance?

    o By monitoring classes

    o By following students' results of tests prepared by teachers

    o By quarterly reports on students' progress submitted by teachers

    o By getting feedback from parents

    o By getting feedback from advisors from the Bureau for Development of Education

    o By external testing

    o By results of integral evaluation of the school

9. Did the school have appropriate/sufficient textbooks for its students in accordance with the Ministry of Education procedures at the beginning of this school year?

    o Yes

    o No

10. Does the school have a library?

    o Yes

    o No

11. Do students from early grades borrow books from the library on a regular basis?

o Yes

o No

12. Does your library have books and story books for early grade students (besides the mandatory reading lists)?

o Yes

o No

13. Has your school supplied didactic materials early grade mathematics over the last three years?

o Yes

o No

14. In which grade do you expect students to be able to read in their first language?

o First

o Second

o Third

o Fourth or higher

15. In which grade do you expect students to be able to write in their first language?

o First

o Second

o Third

o Fourth or higher

16. Does the Parents Council function in your school?

o Yes

o No

17. In general, are you satisfied with the level of support for your school from the Parents Council?

o Yes

o No

18. In general, are you satisfied with the level of parents' participation in monitoring assignments done by their children?

o Yes

o No

19. Does your school have access to the internet?

o Yes and we are satisfied with the speed and quality

o Yes, but we are not satisfied with the speed and quality

o No

10.2   Annex 2: Teacher Questionnaire

1. **Gender**

   o   Male

   o   Female

2. **What is your first language?**

   o   Macedonian

   o   Albanian

   o   Turkish

   o   Serbian

   o   Other

3. **What language do you teach in?**

   o   Macedonian

   o   Albanian

   o   Turkish

   o   Serbian

   o   Other

4. **What is your highest level of education?**

   o   Post-secondary

   o   Higher
   o   Post-graduate

   o   Doctoral

5. **Does your class have special needs students?**

   o   Yes

   o   No

6. **Have you participated in a training course for teaching students how to read while working as a teacher?**

   o   Yes

o   No

7. **Have you participated in a training course for teaching math while working as a teacher?**

   o   Yes

   o   No

8. **Do students from higher grades attend classes in your classroom?**

   o   Yes

   o   No

9. **Are any of your students absent on a regular basis?**

   o   Yes

   o   No

10. **Does the Principal/Assistant Principal verify your daily planning of lessons?**

    o   Yes, once a school year

    o   Yes, once a term

    o   Yes, once a quarter

    o   Yes, once a month

    o   Yes, once every two weeks

    o   Yes, once a week

    o   Every day

    o   No

11. **Do you get feedback after daily planning verification?**

    o   Yes and I try to implement the given suggestions

    o   Yes but I do not find it useful

    o   No

12. **Do you collaborate with your colleagues in regards to daily planning of lessons?**

    o Yes, once a month

o Yes, once every two weeks

o Yes, once a week

o Everyday

o No

13. Who do you consult when you need advice in regards to curriculum?

o Other teachers during experts meetings

o Other teachers during informal conversations

o The Principal

o The Assistant Principal

o Advisors from the Bureau for Development of Education

o There is no adequate person for consultation

o I never need advice

14. How often does the professional support service (psychologist/pedagogue) observe your classes during school year?

o Once a school year

o Once a term

o Once a quarter

o Once a month

o Never

15. Do you get feedback from the professional support service after the class observation?

o Yes and I try to implement the given suggestions

o Yes but I do not find it useful

o Never

16. How often do advisors from the Bureau for Development of Education visit your school?

o Once a school year

- Once a term

- Once a quarter

- Once a month

- Never

17. How often do inspectors from the State Examination Center visit your school?

- Once a school year

- Once a term

- Once a quarter

- Once a month

- Never

18. What do you use to measure student knowledge?

- Written exams

- Oral exams

- Portfolio and other projects

- Homework

- Class activities

- Work sheets

- Mid-term exams

19. What is the purpose of using student results of oral and written exams in your class?

- To grade the student

- To evaluate how much the student understands the material

- To plan class activities

- To adapt class activities in accordance with students' needs

20. Do you know how many of the parents/guardians check your student homework?

- All

- o Many

- o A Few

- o None

21. Are you satisfied with the level of parents' participation in helping their children with school assignments/work?

- o Yes

- o No

22. In which grade do you expect students to be able to read in their first language?

- o First grade

- o Second grade

- o Third grade

- o Fourth grade or higher

23. How do you teach students in your class with poor results?

- o I do not have special methods for such students

- o I pay more attention to students with poor results

- o I assign them more homework

- o I instigate/encourage them

- o I talk with their parents more frequently

- o Students with better results help those with poor ones

- o I provide them with more didactic materials

10.3 Annex 3: Parent Questionnaire

1. Gender

- o Male

- o Female

2. What is your first language?

- o Macedonian

- o Albanian

- o Turkish

- o Serbian

- o Other

3. What language does your child attend classes in?

- o Macedonian

- o Albanian

- o Turkish

- o Serbian

4. **What is your highest level of education?**

- o Elementary

- o Secondary

- o Higher and above

5. Are you a member of the Parents Council in the school?

- o Yes

- o No

6. Did your child go to kindergarten?

- o Yes

  o No

7. Which grade is your child in?

  o First

  o Second

  o Third

  o Fourth

  o Fifth

8. How often is your child absent from school?

  o Seldom, up to two days a year

  o Often, from three to ten days a year

  o Very often, more than ten days a year

9. Does your child know how to read?

  o Yes

  o No

10. Where did your child learn how to read?

  o In school

  o In kindergarten

  o At home with the help of parents

  o At home with the help of grandmother/grandfather, brother/sister

11. How do you get feedback from the school for your child's achievements?

  o Directly from teachers

  o At parents meetings

  o Via text messages

o Via electronic school register

12. Are you engaged in your child's homework assignments?

o Yes, always

o Yes, sometimes

o Yes, whenever my child is not able to do homework independently

o No, my child does homework independently

13. Do you possess books at home?

o Yes, a few

o Yes, many (over 100)

o No

14. Do you have magazines and newspapers at home?

o Yes

o No

15. Do you buy your child books and story books?

o Yes

o No

16. How often do you read with your child?

o Every day

o Once a week

o Once a month

o Seldom

o Never

17. What do you mostly read with your child?

- o Story books

- o Books from the mandatory reading lists

- o Books from library

18. Do you and your child discuss the content after reading?

- o Always

- o Sometimes

- o Never

19. How often does your child read independently?

- o Every day

- o Once a week

- o Once a month

- o Seldom

- o Never

20. What does your child mostly read independently?

- o Story books

- o Books from mandatory reading lists

- o Books from library

10.4   Annex 4: Classroom inventory observation list

School's name	
Grade which attends classes in the classroom	
Number of students in the classroom	
Have the teachers attended training for creating effective learning environment	
Observer's name	
Observer's signature	

1.	Date –please use the following format (dd/mm/yyyy)	☐ ☐ / ☐ ☐ / ☐ ☐ ☐ ☐
2.	How many books/story books besides textbooks are available for children to read in the classroom (books are not kept locked in/outside the classroom)?	None .... 0 1-4 .... 1 5-9 .... 2 10-19 .... 3 20-39 .... 4 40+ 5
3.	Are student works/projects displayed on the classroom wall?	No .... 0 Yes 1
4.	Are teaching materials displayed on the classroom	No 0

	wall?	Yes 1
5.	Is the classroom provided with computers?	No..0 Yes, typical desktop computers ....1 Yes, small classmate computers.......................2
6.	How are chairs and desks arranged in the classroom?	Typically, in rows without computers....…...........1 Typically, in rows with a computer on each desk.2 Computers are arranged on desks along the wall, and desks in the middle are in rows…….…............3 Computers are arranged on desks along the wall, and desks in the middle form small groups…........4 In small groups…………………………………………….5
7.	Does the teacher use digital books, activities, games in the classroom?	No..0 Yes 1
8.	Does the teacher have at his/her disposal/use the following materials: (Please circle any that apply)	Board...1 Smart board...1 Chalk/Markers..1 Manual for first language ....1 Manual for mathematics.....................................1 Laptop computer..1
9.	Is the classroom provided with centers for activities and If yes, describe materials that can be found in it	No..0 Yes 1
10.	Reading (writing, listening) center	
11.	Mathematics center	

12.	Art center	
13.	Science center	
14.	Research center	
15.	Computers center	
16.	Can students choose activities during classes?	No..0 Yes 1
17.	Is there room for cooperative learning?	No..0 Yes 1
18.	Are after-class activities organized for students to improve their reading? (If yes, please list them)	No..0 Yes 1
19.	Are after-class activities organized for students to improve their mathematics skills? (If yes, please list them)	No..0 Yes 1
20.	Does the school have a library?	No..0 Yes 1
21.	Do early grade students have access to the library?	No..0 Yes 1
22.	Is the library provided with books other than compulsory reading lists for early grade students?	No..0 Yes 1
23.	Training courses recommended by teachers:	
24.	Your general impression of the visited classroom:	